

# HVG-WP series

## INSTRUCTION MANUAL

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### Waterproof Digital Platform Scale

HV-60KGL-WP  
HV-200KGL-WP

HV-60KGV-WP  
HV-200KGV-WP





This is a hazard alert mark.



This mark informs you about the operation of the product.

**Note**            This manual is subject to change without notice at any time to improve the product. No part of this manual may be photocopied, reproduced, or translated into another language without the prior written consent of the A&D Company.

Product specifications are subject to change without any obligation on the part of the manufacture.

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# 1. Compliance

## 1.1.1. Compliance with FCC rules

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- Please note that this equipment generates uses and can radiate radio frequency energy. This equipment has been tested and has been found to comply with the limits of a Class A computing device pursuant to Subpart J of Part 15 of FCC rules. These rules are designed to provide reasonable protection against interference when this equipment is operated in a commercial environment. If this unit is operated in a residential area it may cause some interference and under these circumstances the user would be required to take, at his own expense, whatever measures are necessary to eliminate the interference.  
(FCC = Federal Communications Commission in the U.S.A.)

## 1.1.2. Classification of protection provided by enclosures

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- This equipment is designed to comply with the IP Code of IEC 529.  
The "IP-65" code is explained as follows:
  - "IP"      International Protection.
  - "6"      Against ingress of solid foreign objects.  
Dust-tight. No ingress of dust.
  - "5"      Against ingress of water with harmful effects.  
Protected against water jets (no powerful jets). Water projected in jets against the enclosure from any direction shall have no harmful effects.

## Compliance with European Directive

**CE** This appliance features radio interference suppression and safety of electrical equipment designed for certain voltage in compliance with valid EC Regulation 89/366/EEC and 73/23/EEC.

Note: The displayed value may be adversely affected under extreme electromagnetic influences.



## 2. Outline and Features

- These scales are designed to comply with IP-65 of IEC 529
- The HVG-WP series is a platform scale with 1/3000 resolution, and has a "triple weighing range" function to select the weighing range.
- Type L scales have an LCD (Liquid Crystal Display) and use rechargeable batteries as power source to enable use without connecting to AC power. This type can also use an AC adaptor.
- Type V scales have a fluorescent display so the display can be read in dim light. This type uses an AC power line as a power source.
- The counting mode function calculates individual unit weight from a sample of the items to be counted. Once this unit weight is entered, bulk quantities can be counted and shown as a pcs display.
- The scales can display the unit of percentage.
- The accumulation function accumulates each weighing value and can display totals for weight and number of items.
- The comparator function compares the display value with the upper limit value (HI), lower limit value (LO) and displays the result. The result can be output if option OP-03 is installed.
- The simple batch function or full/dribble batch function can be used for batching to a target mass value. The status of a weighing value can be output if option OP-03 or OP-04 is installed. The outputs are zero band, preliminary and Final.
- Using the optional RS-422/RS-485 serial interface and a computer, up to 16 scales can be controlled, if this option is installed in place of the RS-232C serial interface.
- The following parameters are stored in the product with no power supplied.

Unit mass of the counting mode
100% mass of the percentage mode
Total counts and total mass of the accumulation function
Upper limit value and lower limit value of the upper / lower comparator function, Final value, preliminary value and zero band of the full / dribble batch function or Final value, preliminary value and zero band of the simple batch function
Calibration data
Parameters of the function table (f1 ~ f16)

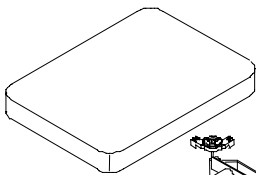
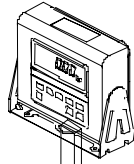


## 3. Unpacking

### Products

HV-60KGL-WP  
HV-60KGV-WP  
HV-200KGV-WP  
HV-200KGL-WP

### Display Unit



### Base Unit

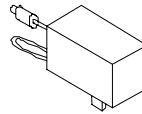
### Caution

**Do not pull the load cell cable**

### All Accessories

Refer to the accessories list at next page. The combination of accessories is according to the product.

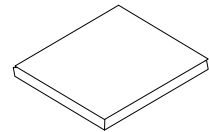
### TB:300 AC Adapter



Please confirm that AC adapter type is correct for your local voltage and receptacle type.



6mm allen wrench



Instruction Manual

- ? Please conform that the Main power type or AC adapter type is correct for your local voltage and receptacle type.
- ? Do not remove the rechargeable batteries from the indicator (type L).



## 3.1. Accessories and Options list

### Accessories for the HVG-WP series

Products		Accessories
Type V	HV-60KGV-WP HV-200KGV-WP	6mm Allen wrench Instruction manual Warranty card
Type L	HV-60KGL-WP HV-200KGL-WP	TB: 300 AC adapter 6mm Allen wrench Instruction manual Warranty card

### Options List

Order code or option name		Accessories
OP-02	5m extension loadcell cable	Tapping screw M4x10
OP-03	RS-232C interface/ Relay output/ Buzzer	Connector JA:TCP0586
OP-04	RS-422/485 interface with relay output	Connector TM:BLA9 AC adapter
OP-13	Roller conveyor for HV-200KGV-WP	
OP-14	Roller conveyor for HV-60KGV-WP	





## 4. Caution



### 4.1. Precautions for Installing the Scale

- ⚠ □ Ground the scale, so that the user will not be subjected to an electric shock.
- ⚠ □ Do not handle the Main power cord with wet hands.
- ⚠ □ The AC plug is not water-resistant. Install it in an area where it does not get wet.
- ⚠ □ Do not install the scale where there is flammable or corrosive gas present.
  - Do not install the scale under water.
  - Do not pull, fold or arrange cables forcibly.

Consider the following conditions to get the most from your scale.

- The best operation is where the temperature and relative humidity are stable, the place to install the scale is a solid floor, there is no draft and the power source is stable.
- Do not install the scale in direct sunlight.
- Do not install the scale near heaters or air conditioners.
- Do not install the scale near equipment which produces magnetic fields.
- Do not install the scale in a place where it is apt to be charged with static electricity, or where the relative humidity is lower than 45%RH. Plastic and isolators are apt to be charged with static electricity.
- Do not use an unstable power source.



### 4.2. Precautions for Operating the Scale

- Periodically ensure that the weighing value is correct.
- Calibrate the scale before using and after moving it to another location.
- Do not place anything on the weighing pan which is heavier than the weighing capacity
- Do not drop anything upon the weighing pan.
- Do not use a sharp instrument such as a pencil or ball-point pen to press the keys. Press the keys gently using only your finger.
- We recommend pressing the **ZERO** or **TARE** key before each weighing to prevent possible error.



### 4.3. Precautions for Storing the Scale

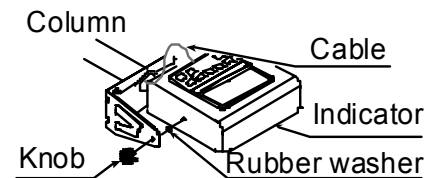
- Do not disassemble the scale.
- Do not use solvents to clean the scale.
- For best cleaning of the display unit, wipe with a dry lint free cloth or a lint free cloth which is moistened with warm water and a mild detergent.
- The base unit can be cleaned with gentle water jets while brushing the base unit. Weigh only after the unit is dry.
- Do not use a powerful water jet.
- Do not remove rechargeable batteries from display unit.



## 5. Installing the Scale

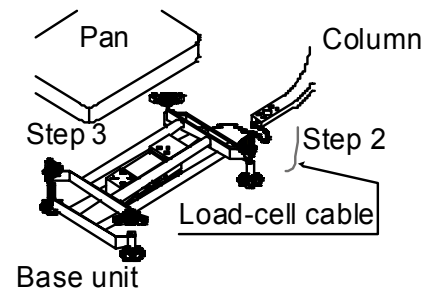
This procedure includes all of the steps for installing the HV-WP series and HW-WP series. Therefore, on some products, there are some unnecessary steps.

Step 1 Connect the indicator unit to the column with the accessory knobs and rubber washers.



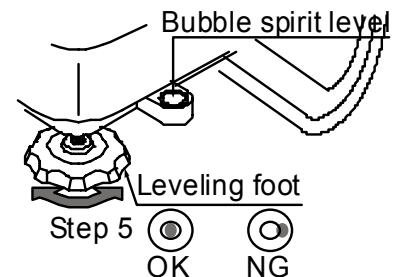
Step 2 Take the base unit and column out, taking care that the load-cell cable is not pulled.

Step 3 Put the weighing pan on the base unit.



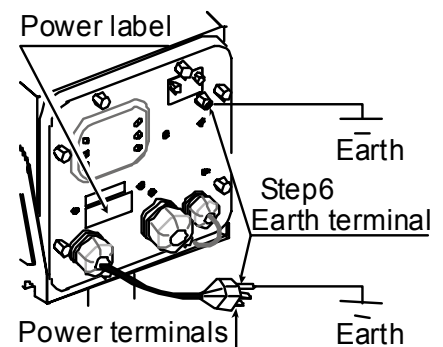
Step 4 Insert the remainder of the load cell cable into the column. Attach the column to the bracket of the base unit so as not to damage the load cell cable. Affix the column to the bracket using two 6mm Allen screws.

Step 5 Select the place for installing the scale. Also consider "4. Caution" on page 7.



Step 6 Adjust the level of the base unit by using the "Bubble spirit level" and "Leveling foot".

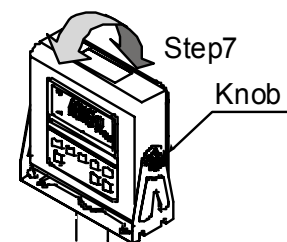
Step 7 Ground the scale using the earth terminal.



### Caution

**Please confirm that the local voltage and the receptacle type are correct for your scale.**

Step 8 Adjust the angle of the indicator unit using the knobs on the side of indicator unit.



Step 9 Check the weighing accuracy. If the scale needs calibration, refer to "14. Calibration" on page 40.



## 5.1. Removing the column

### Caution



- Remove the main power plug before removing the column (type V)
- Remove the AC adapter before removing the column (Type L)
- When removing the loadcell cable, do not pull the loadcell cable connector forcibly and do not pull on the wires of the cable.
- Do not bend the cable forcibly.
- Avoid dust, static electricity and high humidity (or drops) because the inside of the indicator unit is very sensitive.

### Procedure

Step 1 Remove the power plug from the power outlet.  
(Type V). Remove AC adapter from the

Power Jack (Type L).

Step 2 Open the rear cover of indicator unit.  
Disconnect the loadcell cable connector gently  
(perpendicularly, do not pull to the side).

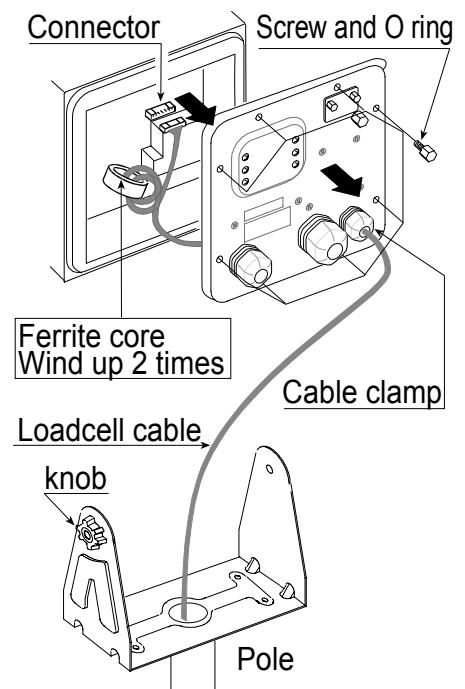
Step 3 Remove the ferrite core and cable clamp from  
the loadcell cable.

Step 4 Loosen the knobs to remove the indicator unit.

Step 5 Remove four 6mm screws from the bottom of the  
column.

Step 6 Carefully remove the cable from the pole and  
pole base so that the connector is not pulled  
forcibly.

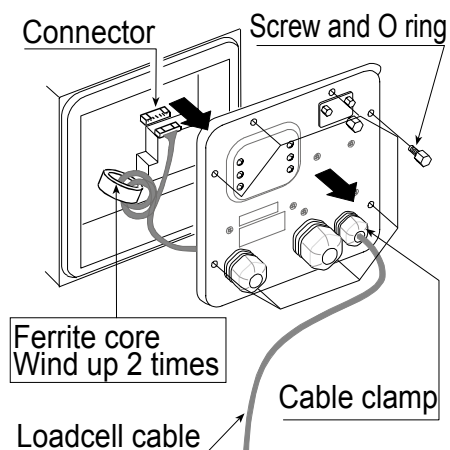
Step 7 Arrange the cable so that it does not touch the  
weighing pan in the base unit. The untied cable  
is at least 2m long. The optional extension  
loadcell cable (OP-02) is 5m long.



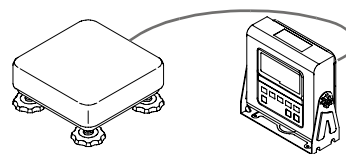
Step 8 Removing the column from the base unit,

Step 9 Wind the cable through the ferrite core two times.  
Affix the cable to the rear cover using the cable clamp.

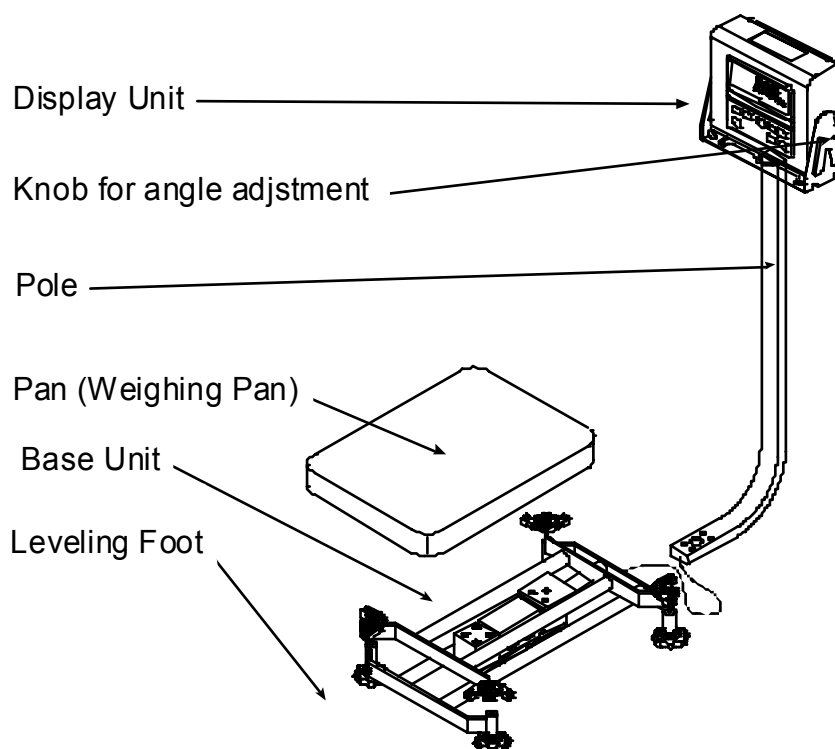
Step 10 Connect the cable to the connector. Close the rear cover.



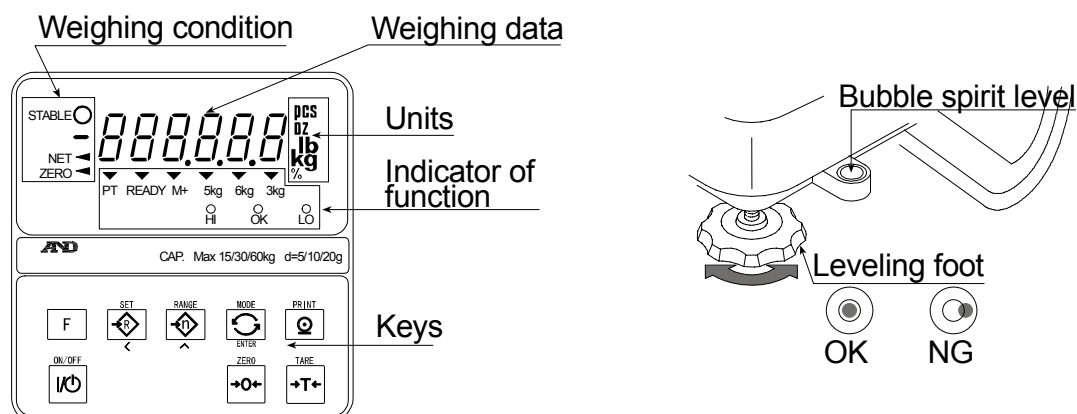
Step 11 Confirm the accuracy of the scale.



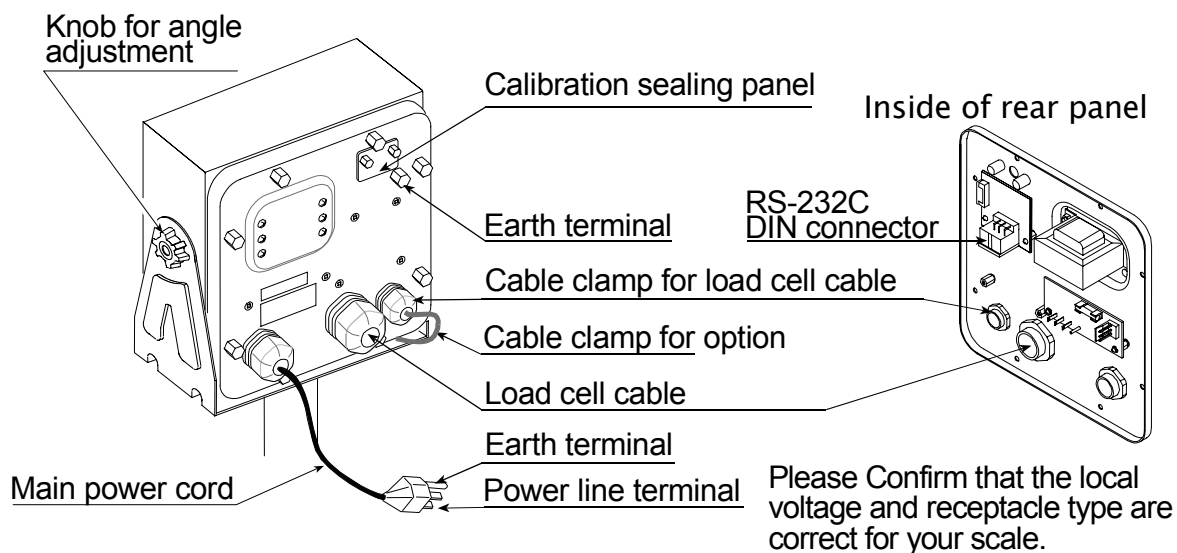
## 6. Names



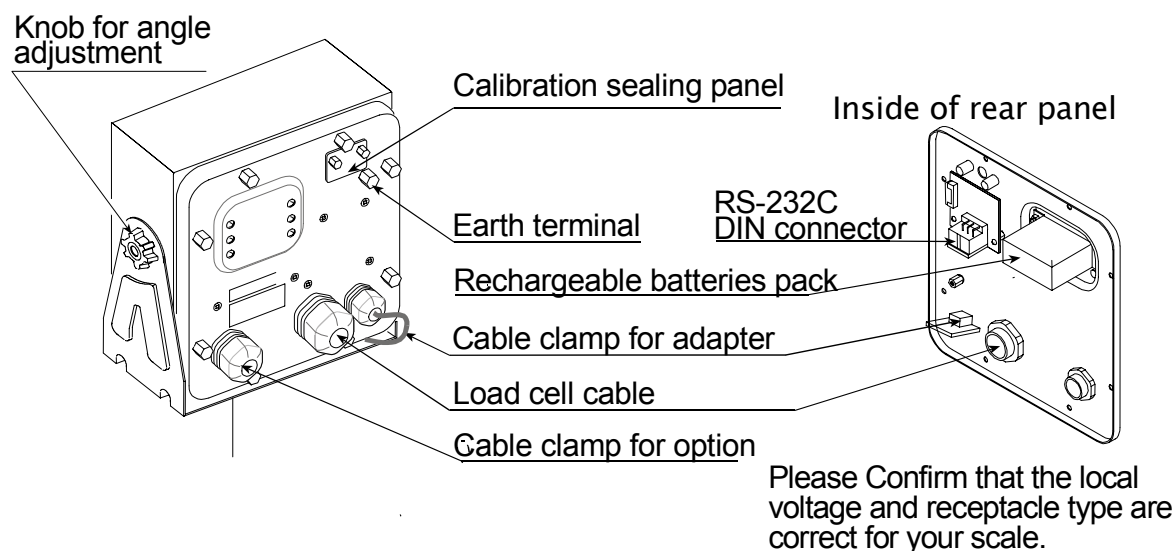
## Display



## Rear of Indicator Unit (VFD)



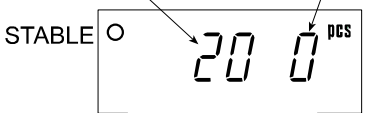

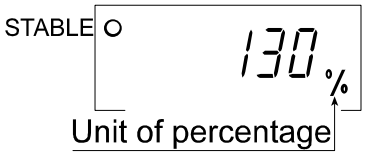
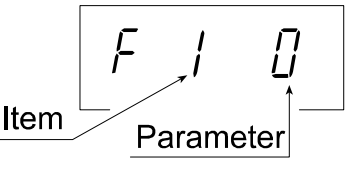
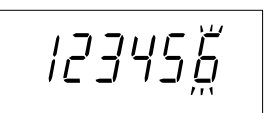
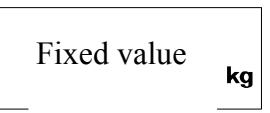
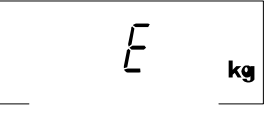
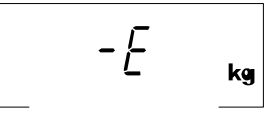
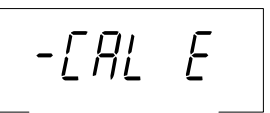
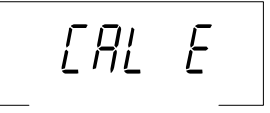
## Rear of Indicator Unit (LCD)




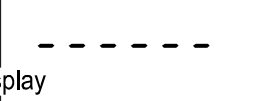
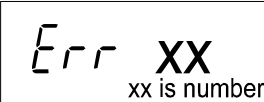







## 6.1. Display and Symbols

Display and Symbols	Meaning
	Stability indicator. Indicates the stability status of the weight display. Symbol is lit when the display is stable.
	Zero indicator. Indicates true center of zero of the weight indication.
	Net indicator. Indicates a tare value has been entered and that the weight displayed is a net value.
	Preset tare indicator. Indicates a preset tare has been entered.
	Accumulation indicator. Indicates the accumulation function is in use.
	Ready indicator. Used with the full/dribble feed batching function. ON Weight within zero band and ready to batch. OFF weight is outside the zero band. Blinking The start or end of the full/dribble batch process above the zero-band.
	The comparator indicator. <ul style="list-style-type: none"> <li>Using the comparator function and comparing a weighing value with the upper and lower limits, the result is indicated.</li> <li>Using the full/dribble batch function, the full flow gate indicator is OK, the dribble flow gate indicator is HI and the zero band indicator is LO.</li> </ul>
ex. HV-60KV-WP    ▽ 60kg ▽ 30kg ▽ 15kg	The weighing range indicator for the HV-WP series. The current range is indicated.
	Example. Display of zero (zero point). With nothing on the weighing pan and pressing the <b>ZERO</b> key, this mark is displayed. The zero point mark is displayed. The stability mark is displayed.
	Example. Display of the counting mode. This mode uses the registered unit mass, and counts the amount of articles on the weighing pan. The unit is <b>pcs</b> .




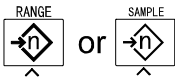
Display and Symbols	Meaning
<p>20 pieces      Zero point</p> 	<p>Example. Storing the unit mass of the counting mode. This is a display of zero point for the counting mode and uses 20 pieces for the registration.</p>
<p>No zero value</p> 	<p>Example. Storing the unit mass of the counting mode. The sign "-" means "weighing value is not zero". Sample number is 10 pieces.</p>
 <p>Unit of percentage</p>	<p>Example. Percentage mode. This mode uses the registered 100% mass, and converts the weighing value to a percentage. The unit is %.</p>
	<p>Example. Display of the function table. This function table sets parameters of items.</p> <p>&lt; key                      Selecting an item.</p> <p>^ key                      Selecting the parameter of an item.</p> <p>[ENTER] key              Storing new parameters.</p>
	<p>Example. Preset tare. Entering tare with digital input.</p> <p>&lt; key                      Selecting a figure.</p> <p>^ key                      Selecting a number.</p> <p>[ENTER] key              Storing a new tare.</p>
	<p>Example. Hold display</p> <p>The hold display is set using <math>\pm 12</math> of the function table. When the value is "nearly-zero" or changes more than 25% +30 digits, the hold is canceled.</p>
	<p>Over load display.</p> <p>Remove the mass from the weighing pan.</p>
	<p>Weighing error.</p> <p>Check the base unit and weighing pan.</p>
	<p>Calibration error.</p> <p>The calibration mass is too light.</p> <p>Check the base unit and weighing pan.</p>
	<p>Calibration error.</p> <p>The calibration mass is too heavy.</p> <p>Check the base unit and weighing pan.</p>

The "nearly-zero" is within  $\pm 4$  digits from zero point in the unit of kg.








Display and Symbols	Meaning
 <p>Fixed display</p>	<p>An error where the weighing value is unstable due to drift, vibration or other, when turning on the scale. Check around the weighing pan. Check the connection of load cell cable.</p>
 <p>Fixed display</p>	<p>Remove anything that may be on the weighing pan. Check around weighing pan. Perform zero point calibration of the scale.</p>
	<p>Error indication. Refer to "19 Maintenance".</p>
<p>Blinking</p> 	<p>Accumulated data count.</p>
<p>Blinking</p> 	<p>Total mass value of the accumulated data.</p>
<p>Blinking</p> 	<p>Comparator function, display is an upper limit. Full/dribble batch function, the display is a final value.</p>
<p>Blinking</p> 	<p>Full/dribble batch function, the display is a preliminary value.</p>
<p>Blinking</p> 	<p>Comparator function, display is a lower limit. Full/dribble batch function, the display is the zero band.</p>
<p>CAP. MAX. 15/30/60kg d=5/10/20g</p>	<p>Description of the weighing unit, weighing range and measurable minimum mass.</p>



## 6.2. Keys

Display and Symbols	Meaning
	<p>Display ON/ OFF key. Note Standby status when power is connected.</p>
	<p>Zero key. When there is nothing on the weighing pan and the <b>ZERO</b> key is pressed, the scale displays the mass value of zero and the zero point mark. Net is canceled, if it is displayed.</p>
	<p>Tare key. Canceling the mass of a receptacle, case, bag, etc. which is put on the weighing pan, and does not weigh its mass.</p>
	<p>Range key, Sample key.</p> <ul style="list-style-type: none"> <li>□ Changing weighing range for HVG-WP series.(Refer to <math>\text{f2}</math> )</li> <li>□ Storing the unit mass, it is used to select a sample number.</li> <li>□ In the function table, it is used to select a parameter.</li> </ul>



Display and Symbols	Meaning
	<p>Set key.</p> <p>Turns the comparator on/off. (Refer to f6 )</p> <ul style="list-style-type: none"> <li>□ Counting mode, it is used to enter the mode to store the unit mass.</li> <li>□ Percentage mode, it is used to enter the mode to store the 100% mass.</li> <li>□ The full/dribble batch function, it is used as a start key.</li> <li>□ For the preset tare and selecting a calibration mass, it is used to select a figure.</li> </ul>
	<p>Mode key.</p> <ul style="list-style-type: none"> <li>□ Changing the current unit. While setting modes, this key is used for " storing a parameter and proceeding to the next step".</li> </ul>
	<p>F key.</p> <ul style="list-style-type: none"> <li>□ Full/dribble batch function, it is used to finish the process. (Refer to f10 )</li> <li>□ Hold key. (Refer to f12 )</li> <li>□ Setting a preset tare, selects polarity (+,-).</li> </ul>
<p>Display off</p> <p>↓</p> <p>Press and hold </p> <p>And press </p>	<p>Used to enter the function table.</p>
<p>Press and hold </p> <p>And press </p>	<p>Used to enter the mode to set a preset tare.</p>



## 7. Basic Operation



### 7.1. Turning the Scale on/off and Weighing

#### 7.1.1. Type V or Type L with AC Adapter

---

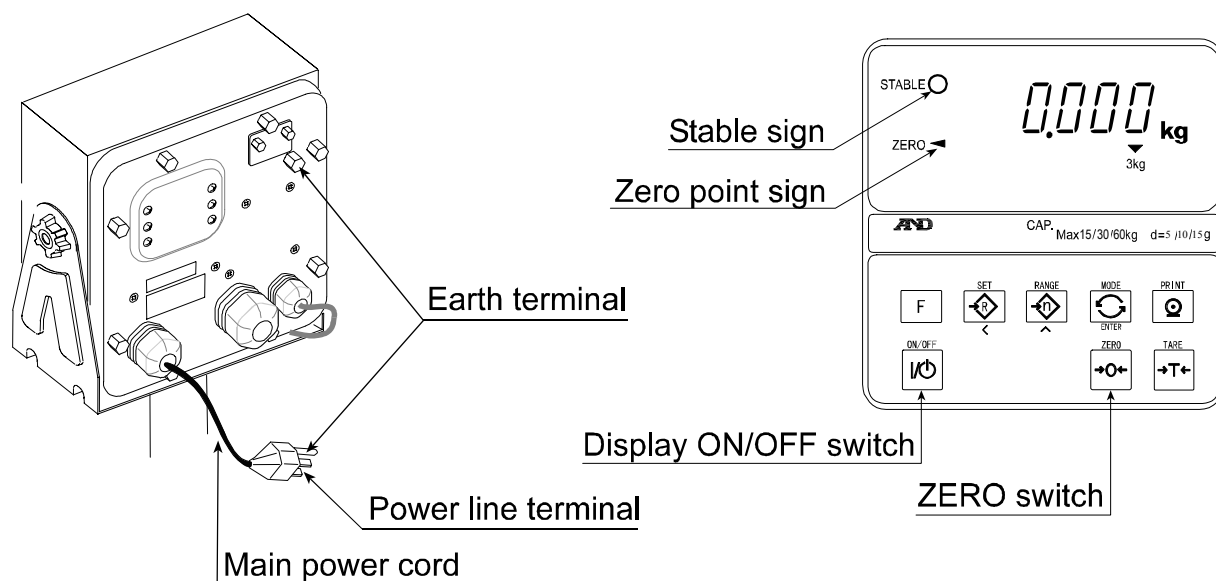
- Step 1 Ground the scale using the earth terminal.
- Step 2 Confirm nothing is placed on the weighing pan.
- Step 3 Confirm that local voltage and outlet type are correct.
- Step 4 The scale turns on using the **ON/OFF** key.
- Step 5 Check the accuracy of weighing. Allow 30 minutes warming up before calibration.
- Step 6 With nothing on the pan, press the **ZERO** key to display zero.
- Step 7 Place an article on the weighing pan gently.
- Step 8 Wait for the stability mark to be displayed. Read the weight.
- Step 9 Remove the article from the weighing pan.
- Step 10 Turn the scale off using the **ON/OFF** key.

#### Memo

- With the power cord connected, type V is in standby status after the scale is turned off using the **ON/OFF** key. To shut down the power completely, disconnect the power cord.
- With the AC adapter connected, the power is off at the scale, but not from the AC adapter, after the scale is turned off using **ON/OFF** key. To shut down the power completely, disconnect the AC adapter.

#### Caution

- **The HVGL-WP scale should only be operated using the adapter supplied. Failure to do this could result in damage to the rechargeable batteries and a void of the product warranty.**



**⚠ Please confirm that the local voltage and receptacle type are correct for your scale.**

## 7.1.2. Type L with Rechargeable batteries

- Step 1 Confirm nothing is placed on the weighing pan.
- Step 2 Plug AC adapter into mains power.
- Step 3 Connect AC adapter to the scale and charging begins.
- Step 4 Disconnect AC adapter from the scale after charging 16 hours.
- Step 5 Turn on the scale using the **ON/OFF** key.
- Step 6 Check the accuracy of weighing. Allow 30 minutes warming up before calibration.
- Step 7 With nothing on the pan, press the **ZERO** key to display zero.
- Step 8 Place an article on the weighing pan gently.
- Step 9 Wait for the stability mark to be displayed. Read the weight.
- Step 10 Remove the article from the weighing pan.
- Step 11 Turn the scale off using the **ON/OFF** key.

### Caution

- ❑ **Do not remove rechargeable batteries from the display.**



## Tare (And Net Display)

"Tare" is used to cancel the mass of a container, receptacle, case, bag, etc. which is put on the weighing pan to contain the item to be weighed.

### Caution

- ❑ Using a tare value reduces the weighing range.
- ❑ The current tare value is reset by pressing the **ZERO** key or turning the scale off. (Reset value is zero.)
- ❑ The preset tare value must be within the minimum weighing range for the HV-WP series.

### 7.1.3. Manual Tare

---

- Step 1 Put the container on the weighing pan.
- Step 2 Press the **TARE** key. The display becomes zero and the net mark is displayed.
- Step 3 It is now possible to put something into the container and to read its net display.
- Step 4 Once weighing with tare is complete, remove all items from pan and press **ZERO** key to return to true zero.

### 7.1.4. Preset Tare

---

- Step 1 Press and hold the **SET** key and press the **TARE** key.  
The blank or stored tare value is displayed. A blank display means that the tare value is zero (reset value), and **PT** or **PT** blinks.
- Step 2 Set the preset tare value by using the following keys.
- |                 |                                  |
|-----------------|----------------------------------|
| <b>△</b> key    | Adjusts the value of the figure. |
| <b>&lt;</b> key | Selects a figure.                |
| <b>F</b> key    | Selects the polarity (+,-).      |
- Step 3 Press the **ENTER** key to store the new preset tare value.  
Then the scale displays a net value with the tare value subtracted from the gross weighing value.
- Step 4 It is then possible to put something into the container and to read its net.
- Step 5 Once weighing with tare is complete, remove all items from pan and press **ZERO** key to return to true zero.



## 7.2. Weighing Range for the HVG-WP series

- This is the function to nominate the weighing range selection process for the HVG-WP series. The mass value is displayed within a selected range.
- There is the automatic range (F2 0) and manual range (F2 1) using the **[RANGE]** key.

### Operation and Performance

Function table	Meaning and purpose
F2 0	<p>Automatic range</p> <ul style="list-style-type: none"> <li>□ The weighing range changes automatically, if the weighing value proceeds from narrow range to wide range when placing articles on the weighing pan.</li> <li>□ When there is nothing on the weighing pan and the zero point mark is displayed, it changes to the minimum range automatically.</li> <li>□ Press the <b>[ZERO]</b> key to change to the minimum range, when there is nothing on the weighing pan and the zero point mark is not displayed due to net display or zero error.</li> </ul>
F2 1	<p>Manual range</p> <ul style="list-style-type: none"> <li>□ Press the <b>[RANGE]</b> key to expand the range.</li> <li>□ Press the <b>[RANGE]</b> key to change to the minimum range, when there is nothing on the weighing pan and the zero point mark is displayed.</li> <li>□ Press the <b>[ZERO]</b> key and the <b>[RANGE]</b> key to change to the minimum range, when there is nothing on the weighing pan and the zero point mark is not displayed due to net display or zero error.</li> </ul>

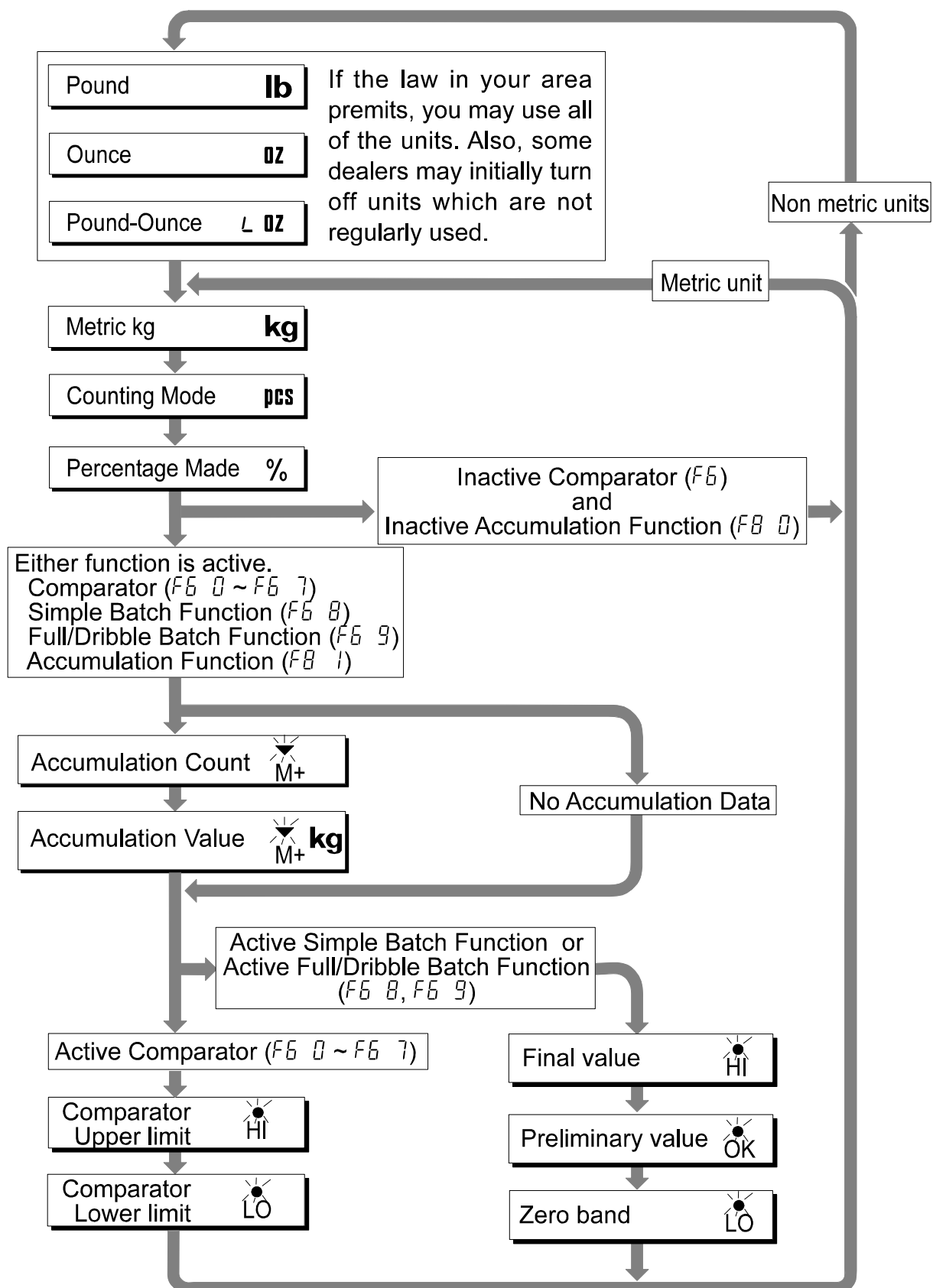
### Weighing Range

Products	Weighing Range
HV-60KGV-WP HV-60KGL-WP	15kg, 30kg, 60kg
HV-200KGV-WP HV-200KGL-WP	60kg, 150kg, 220kg



## 7.3. Mode Key (Changing Unit and Mode)

Pressing the **MODE** key, the display changes as follows. Refer to function table 3 for units. Usable units are according to the factory settings.



## Explanation

- The status of "Inactive comparator (F6)" is that comparator function (F6 0, F6 2, F6 4, F6 6) is selected and the comparator is not used. The "active" or "Inactive" (ON/OFF) for the comparator can be selected by pressing the SET key alternately.
- The following parameters are stored in the same memory. Therefore, the functions can not be used at the same time. If you use each function, it will be necessary to reselect the function from the function table and to set the parameters of HI, OK and LO for each application.

	Memory address / Indicator and Output		
	HI	OK	LO
Upper/Lower Comparator Function (f6 0 ~ 7)	Upper limit		Lower limit
Simple Batch Function (f6 8)	Final value	Preliminary value	Zero band
Full/ Dribble Batch Function (f6 9)	Final value	Preliminary value	Zero band



## 8. Counting Mode

- The counting mode is the function to convert the total mass value (total weight) of articles to a count by calculating a unit weight for each individual item.
- It is necessary to store this unit weight to count articles.



### 8.1. Storing a Unit Mass

Step 1 Press the **[MODE]** key to display the unit **pcs**.

Step 2 Press the **[SET]** key to enter the mode to store a unit mass.

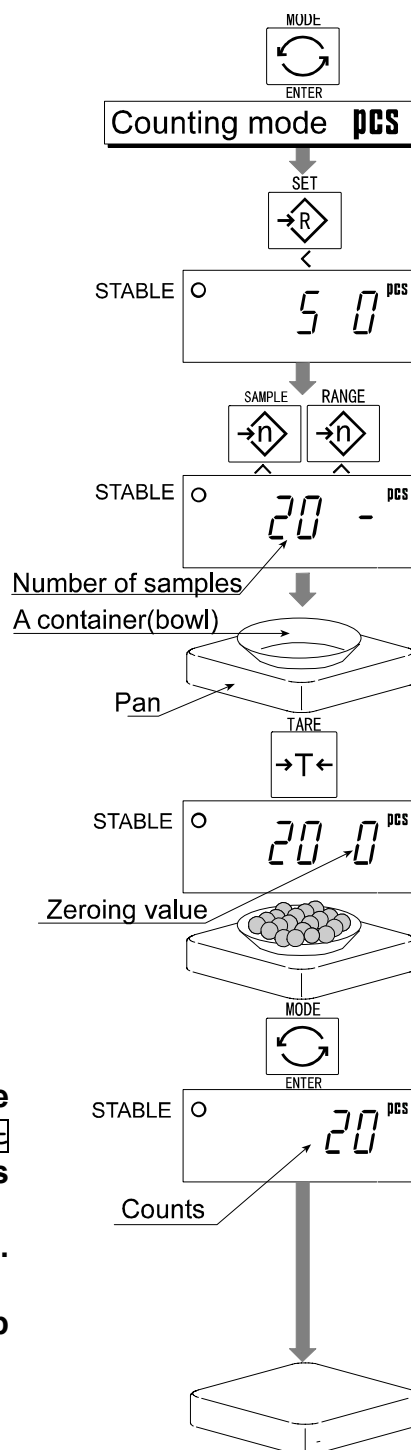
Step 3 Press the **[^]** key to select the number of samples.  
The greater the quantity of samples, the greater the accuracy of the count.  
5 pieces, 10 pieces, 20 pieces, 50 pieces, 100 pieces

Step 4 Put a container item on the weighing pan.  
Press the **[TARE]** key.

Step 5 Put in the number of samples as selected at step 3.  
Press the **[ENTER]** key to store the value after the stability mark is displayed. Then the count is displayed.

#### Caution

- When the sample is too light and it is not possible to calculate a unit mass, the scale displays **[lo ut]** and returns to step 3. The sample quantity needs to be increased.
- Pressing the **[ENTER]** key after **[lo ut]** is displayed. It will display the larger sample quantities.
- Select a larger sample quantity and move to step 4.







## 8.2. Counting the number of articles

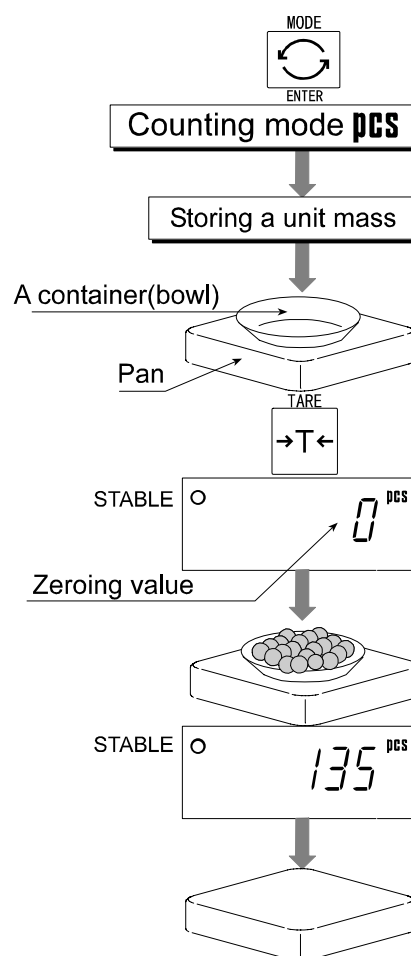
Step 1 Press the **MODE** key to display the unit **pcs**.

Step 2 Store the articles unit mass.  
Refer to "8.1 Storing a Unit Mass"

Step 3 Place the container item only on the weighing pan.  
Press the **TARE** key.

Step 5 Put articles in the container item and read the count.

Step 6 Remove all things from the weighing pan.





## 9. Percentage Mode

- The percent mode is the function to display a mass value in the unit of "%".
- Store a 100% mass value, in advance, to use this function.



### 9.1. Storing a 100% Mass

Step 1 Press the **[MODE]** key to display the unit %.

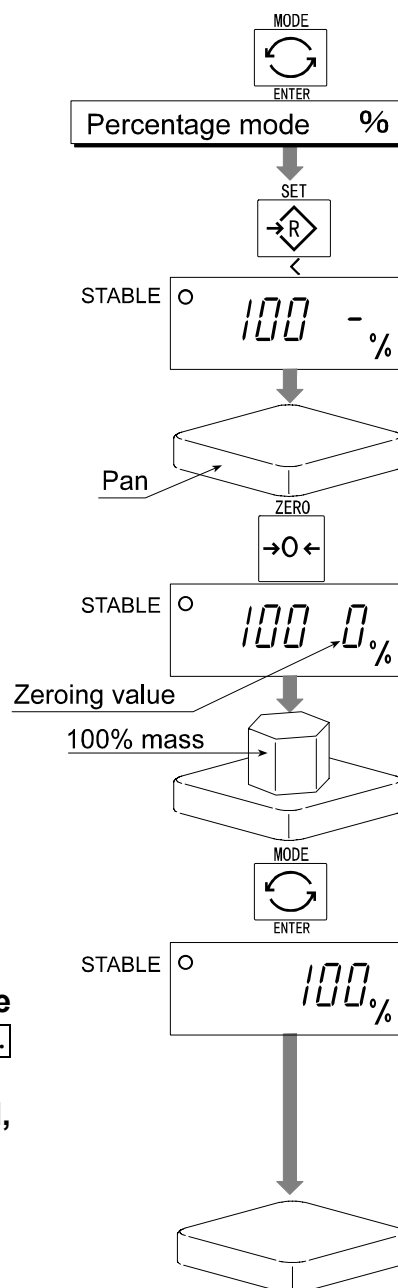
Step 2 Press the **[SET]** key to enter the mode that stores a 100% mass.

Step 3 With nothing on the weighing pan, press the **[ZERO]** key to display zero.

Step 4 Place the 100% mass on the weighing pan gently. Press the **[ENTER]** key, to store the 100% mass after the stability mark is displayed. Then the percentage is displayed.

#### Caution

- When the sample is too light and it is not possible to calculate a 100% mass, the scale displays **[1o.]** and returns to step 3.
- Pressing the **[ENTER]** key after **[1o.]** is displayed, the next unit is displayed.





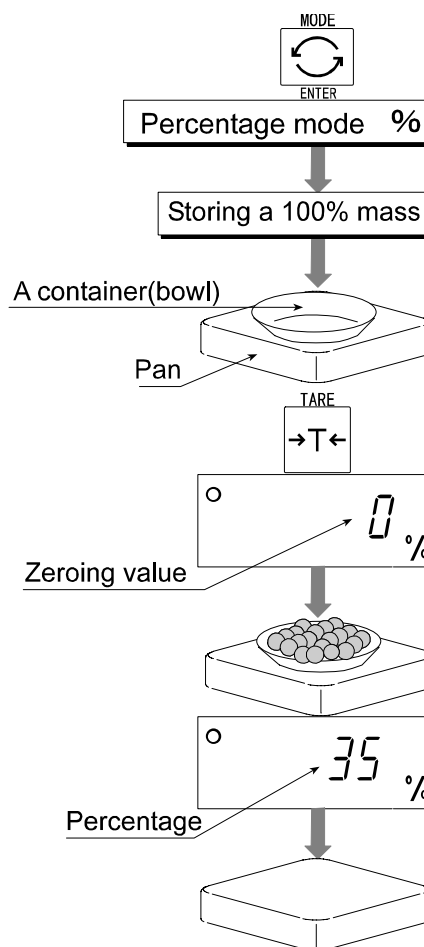
## 9.2. Reading percentage

Step 1 Press the **MODE** key to display the unit %.

Step 2 Store the unit mass of the article.  
Refer to "9.1 Storing a 100% Mass "

Step 3 If a container is needed, place the tare item only  
on the weighing pan and press the **TARE** key.

Step 4 It is now possible to put something on the  
weighing pan and read the percentage.





## 10. Accumulation Function

- This function counts the number of weighed items, calculates the total mass value and can display the number and accumulated mass value.
- Set the parameters of the "accumulation function (  $\boxed{f8}$  )" in the function table, in advance, to use this function.

### Operation and Keys

- The display of the accumulation count has a blinking  $\overline{M}+$  without a unit.
- The display of the accumulation value has a unit and a blinking  $\overline{M}+$ .
- Pressing the  $\boxed{\text{MODE}}$  key, the accumulation count and accumulation value are displayed.
- Pressing the  $\boxed{\text{ZERO}}$  key in the accumulation function (  $\overline{M}+$  is blinking), the current function resets. (The count and accumulated value become zero.)

### Caution

**The accumulation function can be used with the first weighing unit accumulated.  
This function can display a maximum of six figures.**

### Parameter List and Word Definition

- The "near-zero" is within  $\pm 4$  digits from the zero point in the unit of kg.
- The "digit", a unit of display, is equivalent to the minimum measurable mass.
- The "zero point" is the fundamental starting point to weigh anything.

Function table	Meaning and purpose
$f8\ 0$	Accumulation function not used.
$f8\ 1$	The scale accumulates the data, if the $\boxed{F}$ key is pressed, when the display is a positive stable value without near-zero. The next accumulation can be performed after the display is nearly-zero or a negative value.
$f8\ 2$	The scale accumulates the data, if the $\boxed{F}$ key is pressed, when the display is a stable value and without near-zero. The next accumulation can be performed after the display is near-zero.
$f8\ 3$	When the display is a positive stable value, the scale accumulates the data automatically. The next accumulation can be performed after the display is near-zero or a negative value.

Function table	Meaning and purpose
$f8\ 4$	When the display is a stable value, the scale accumulates the data

	<p>automatically. The next accumulation can be performed after the display is near-zero.</p> <p>Use     Recording the number and mass of articles removed from the weighing pan. (Put the articles on the weighing pan. Press the <b>TARE</b> key at each removal.)</p>
f8 5	<p>At each finish of the full/dribble batch function, the scale accumulates the data automatically.</p> <p>Use     Packaging articles like a powder, it is used for recording the bag number and total mass.</p>



## 10.1. Preparation (Setting Parameters)

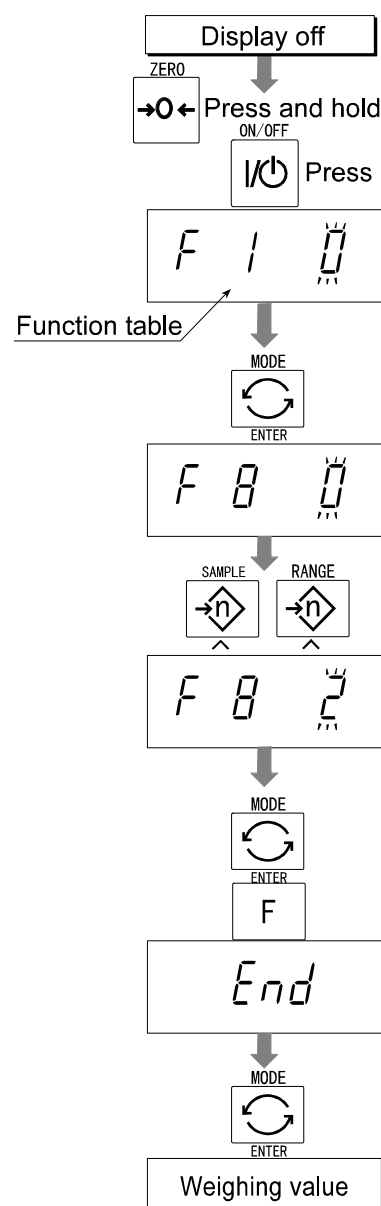
Step 1 Turn off the display.

Press the **ON/OFF** key while the **ZERO** key is pressed and held. The function table is displayed.

Step 2 Press the **ENTER** key to repeatedly until F8 is displayed.

Step 3 Select a parameter for the accumulation function ( **f8 1** ~ **f8 4** ) with the **^** key.

Step 4 Press the **ENTER** key to store the new parameter. Press the **F** key and the **ENTER** key to exit from the function table. Then the scale returns to the weighing mode.





## 10.2. Operation and Performance (Examples)

### Example 1

Weighing each article, the scale makes the accumulation according to f8 3.

Step 1 Press the MODE key to display  $\nabla M^+$ .

Step 2 Press the ZERO key to reset the accumulation data.

Step 3 Return to the kg mode using the MODE key.

Press the ZERO key with nothing on the weighing pan.

Step 4 Put an article on the weighing pan. Wait for the stability mark to be displayed and the value to be blinking. Remove the article and press the ZERO key.

Step 5 Weigh additional articles using step 4.

Step 6 Press the MODE key to display the number of articles and total mass with  $\nabla M^+$ .

### Example 2

This example accumulates the articles that were removed from the weighing pan. The function parameter is set to f8 4.

Step 1 Enter into the kg mode using the MODE key.

Put all articles on the weighing pan and press the TARE key.

Step 2 Press the MODE key to display  $\nabla M^+$ .

Step 3 Press the ZERO key to reset the accumulation data.

Return to kg mode with the MODE key.

Step 4 Remove an article from the weighing pan. Wait for the stability mark to be displayed and the value to be blinking. Press the TARE key.

Step 5 Weigh additional articles using step 4.

Step 6 Press the MODE key to display the number of articles and total mass with  $\nabla M^+$ .



# 11. Upper/Lower Comparator Function

- This function compares a display value with the upper limit (HI), the lower limit (LO) and displays the result.
- Set the "comparator function ( [F6 0] ~ [F6 7] )" parameters, upper limit value (HI) and lower limit value (LO) in the function table, in advance, to use this function.
- Install option OP-03 or OP-04, to use the relay output of the comparator.
- Install option OP-03, to use the buzzer output of the comparator.

## Comparator Sign

Comparison results are displayed by indicators  $\overset{\circ}{\text{HI}}$   $\overset{\circ}{\text{OK}}$   $\overset{\circ}{\text{LO}}$ .

## Comparison Condition

Weighing value < lower limit value.....LO is displayed and output.

Lower limit value  $\leq$  weighing value  $\leq$  upper limit value...OK is displayed and output.

Weighing value > Upper limit value.....HI is displayed and output.

## Parameter List and Word Definition

- The term "near-zero" is within  $\pm 4$  digits from the zero point in the unit of kg.
- The term "digit", a unit of display, and is equivalent to the minimum measurable mass.
- The term "zero point" is the fundamental starting point to weigh anything.

Function table	Meaning and purpose
F6 0	Pressing the [SET] key activates the comparator which compares all values.
F6 1	The comparator is permanently activated and compares all values.
F6 2	Pressing the [SET] key and activates the comparator which compares all values except those near zero.
F6 3	The comparator is permanently activated and compares all values except those near zero.
F6 4	The comparator can be activated and deactivated by pressing the [SET] key which provides the weight display is stable.
F6 5	The comparator is permanently activated but compares stable data only.
F6 6	The comparator can be activated and deactivated by pressing the [SET] key for stable values except those near zero.

Function table	Meaning and purpose
F67	The comparator is permanently activated and compares stable values only, except those near zero.

### Caution

- The upper limit value (HI) must be greater than the lower limit value (LO).
- The parameters of the upper limit value (HI) and the final value (HI) use the same memory. The parameters of the lower limit value (LO) and the zero band (LO) use the same memory.
- The upper/lower comparator function, the simple batch function and the full/dribble batch function can not be used at the same time because these parameters use common memory.

## 11.1. Preparation (Setting Parameters)

Step 1 Turn off the display.

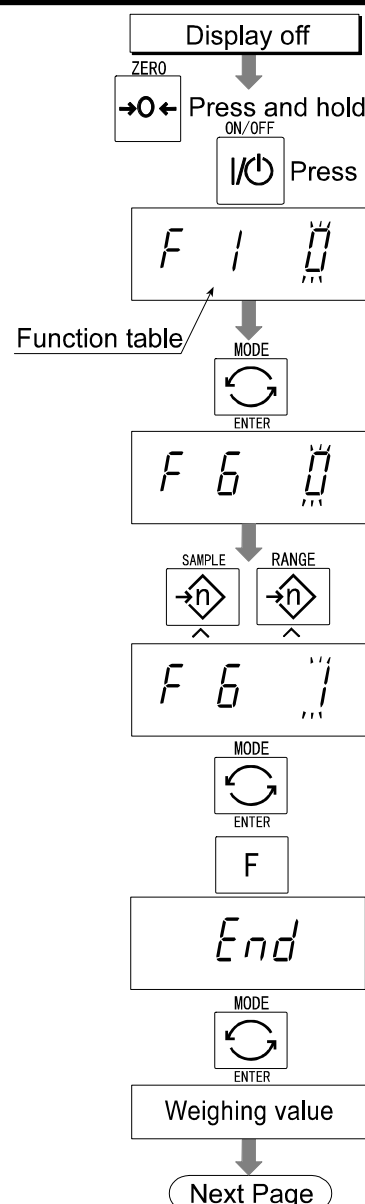
Press the **[ON/OFF]** key while the **[ZERO]** key is pressed and held. F1 is displayed.

Step 2 Press the **[ENTER]** key repeatedly until F6 is displayed.

Step 3 Select a parameter of the comparator function ( **[f6 0]** ~ **[f6 7]** ) with the **[^]** key.

Step 4 Press the **[ENTER]** key to store the new parameter.

Step 5 Press the **[F]** key and the **[ENTER]** key to exit from the function mode. The scale returns to the weighing mode.





Step 6 If either of f6 0, f6 2, f6 4, f6 6 has been selected, press the SET key to use the comparator.

Step 7 Press the MODE key to display the blinking HI.

Step 8 Set the upper limit value by using the following keys.

△ key Adjusts the value of a figure.

< key Selects a figure.

F key Selects polarity (+,-).

Step 9 Press the ENTER key to store the new parameter and display the blinking LO.

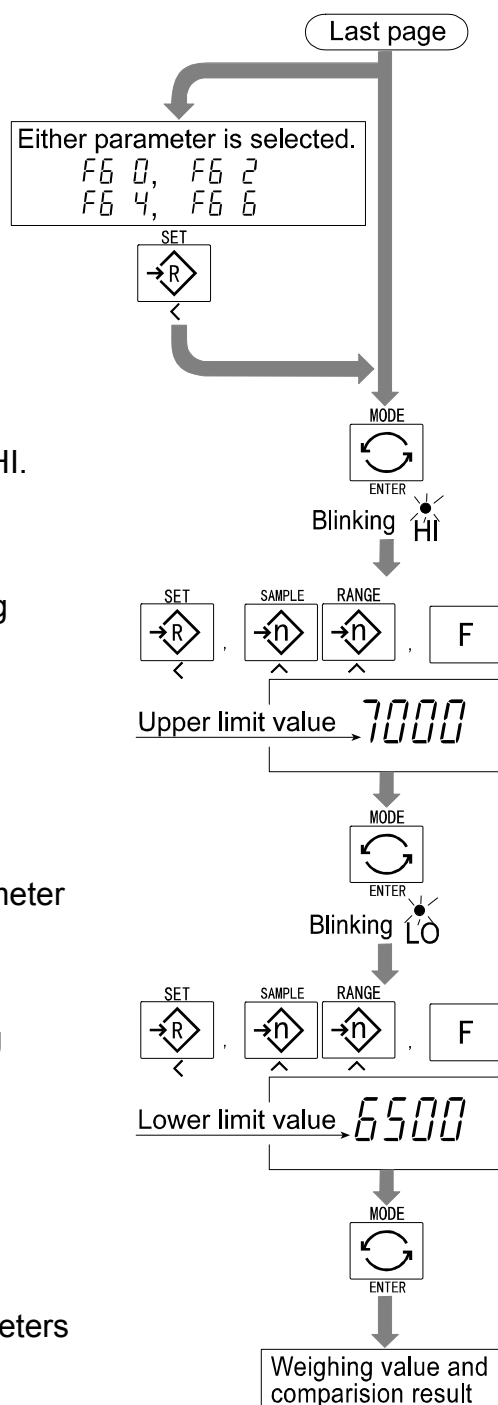
Step 10 Set the lower limit value by using the following keys.

△ key Adjusts the value of a figure.

< key Selects a figure.

F key Selects polarity (+,-).

Step 11 Press the ENTER key to store the new parameters and return to the weighing mode.





## 11.2. Operation and Performance (Examples)

### Example 1

This example is set as follows:

Function table	<span>⌘6 3</span>	(The comparator is permanently activated and compares all values except those near zero.)
Upper limit value (HI)	7.000kg	
Lower limit value (LO)	6.500kg	

#### Performance

- The comparison starts at turning the scale on.
- When the current value is less than 6.500kg, LO is displayed.
- When the current value is 6.500kg to 7.000kg, OK is displayed.
- When the current value is greater than 7.000kg, HI is displayed.

### Example 2

This example is set as follows:

Function table	<span>⌘6 4</span>	(The comparator can be activated and deactivated by pressing the <span>SET</span> key which provides the weight display is stable.)
Upper limit value (HI)	2.000kg	
Lower limit value (LO)	-1.000kg	

#### Performance

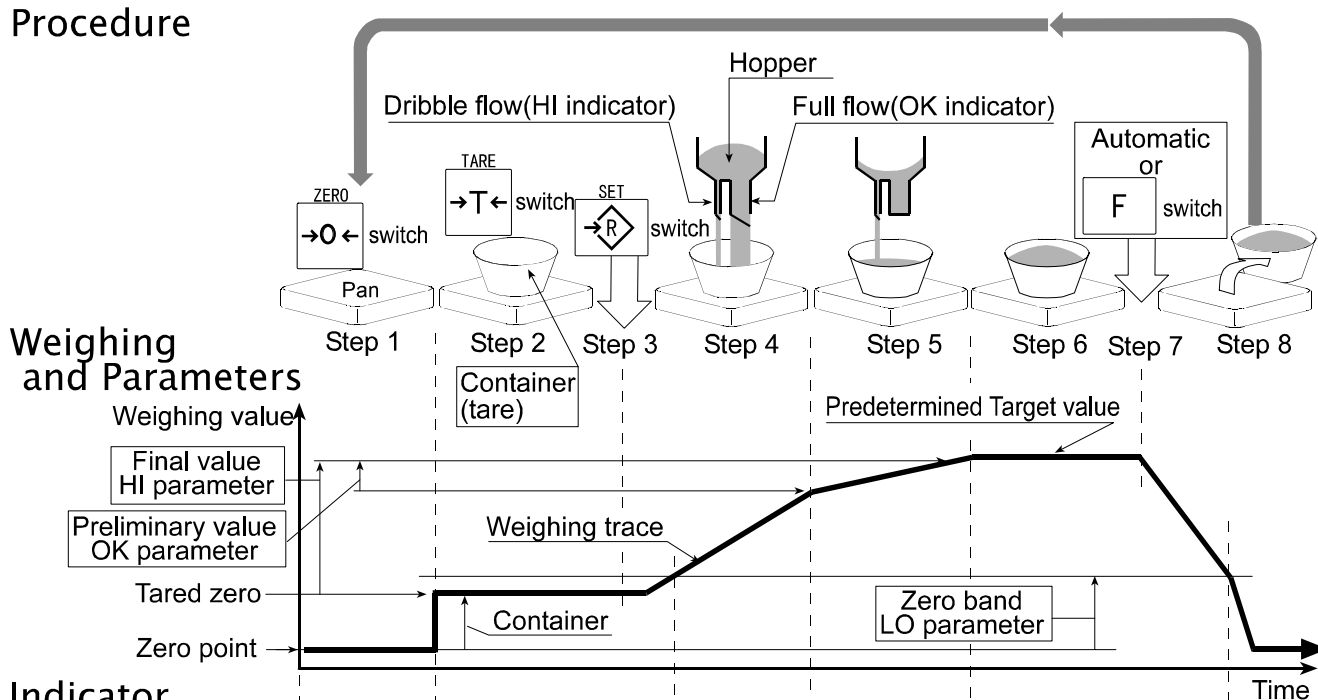
- Pressing the SET key, the comparison is performed after displaying the stability mark.
- When the current value is less than -1.000kg, LO is displayed.
- When the current value is -1.000kg to 2.000kg, OK is displayed.
- When the current value is greater than 2.000kg, HI is displayed.



## 12. Full/Dribble Batch Function

- This function allows the scale to control a 2 speed batching process with full and dribble feed conditions.
- To use this function, the following parameters need to be set: F6 to setting 9, F10 to the setting of your choice, HI(dribble), OK(full feed) and LO(zero band).
- Install option OP-03 or OP-04, to use the relay output of the full/dribble batch function.
- The functionality and performance of this function are as follows:

### Procedure



### Indicator and Output

READY indicator	ON	OFF	OFF	Blinking	ON
Zero band, LO indicator	ON	OFF	OFF	OFF	ON
LO relay	Make	Break	Break	Break	Make
Full flow, OK indicator	OFF	ON	OFF	OFF	OFF
OK relay	Break	Make	Break	Break	Break
Dribble flow, HI indicator	OFF	ON	ON	OFF	OFF
HI relay	Break	Make	Make	Break	Break

	Zero band indicator/ LO relay output	Preliminary value indicator/ OK relay output	Final value indicator/ HI relay output
Gross < Zero band (Zero detection Level)	ON / Make	OFF / Break	OFF / Break
Net < Final - Preliminary	OFF / Break	ON / Make	ON / Make
Final - Preliminary ≤ Net < Final	OFF / Break	OFF / Break	ON / Make
Final ≤ Net	OFF / Break	OFF / Break	OFF / Break

## Caution

- ❑ The comparison of the full/dribble batch function is a one way sequence (not reversible). If the display value becomes less than the final value after the value reached a predetermined target value, neither HI or LO is on.
- ❑ The parameters of the upper limit value (HI) and the final value (HI) use the same memory. The parameters of the lower limit value (LO) and the zero band (LO) use the same memory.
- ❑ The upper/lower comparator function, the simple batch function and the full/dribble batch function can not be used at the same time because these parameters use common memory.
- ❑ Set the zero band greater than the tare value.

## Operation

- ❑ Pressing the **SET** key and start the batch process.
- ❑ If selecting a parameter of 0 or 2 for F10, the F key acts as the finish input.

## Parameter List and Word Definition

- ❑ The term "gross" is a total weighing value where the tare value is not subtracted.
- ❑ The term "net" is a measurement value with the tare value subtracted from the gross.
- ❑ The term "zero band" is the zero detection level.
- ❑ The term "zero point" is the fundamental starting point to weigh anything.

### Comparator

Function table	Meaning and purpose
f6 9	Full/dribble batch function.

### Full/dribble batch sub-function

Function table	Meaning and purpose
f10 0	Reaching final value and pressing the <b>F</b> key, the current process is finished.
f10 1	Reaching final value and displaying the stability mark, the current process is finished automatically.
f10 2	Pressing the <b>SET</b> key, the scale automatically tares and starts the full/dribble batch process. Reaching final value and pressing the <b>F</b> key, the current process is finished.
f10 3	Pressing the <b>SET</b> key, the scale automatically tares and starts the full/dribble batch process. Reaching final value and displaying the stability mark, the current process is finished.

### Hold

Function table	Meaning and purpose
f12 0	The hold function is not used.



## 12.1. Preparation (Setting Parameters)

Step 1 Turn off the display.

Press the **ON/OFF** key while the **ZERO** key is pressed and held. The function table is displayed.

Step 2 Press the **ENTER** key repeatedly until F6 is displayed.

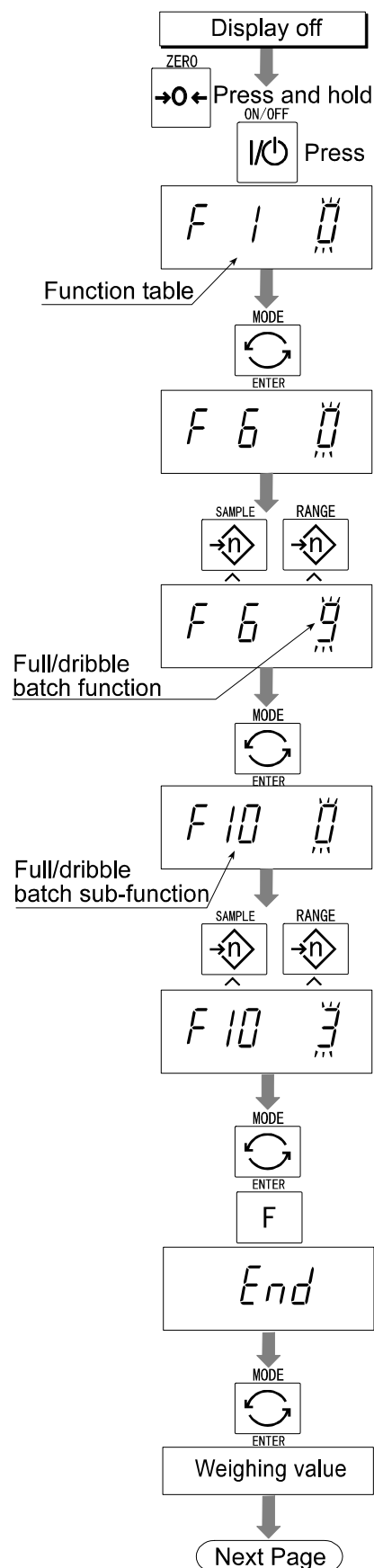
Step 3 Select a parameter setting F9 with the **△** key.

Step 4 Press the **ENTER** key to store the new parameter and display F10.

Step 5 Select a parameter of the full/dribble batch sub-function F10 (0~3) with the **△** key.

Step 6 Press the **ENTER** key to store the new parameter

Step 7 Press the **F** key and the **ENTER** key to exit from the function table. The scale returns to the weighing mode.



Step 8 Press the **[MODE]** key to display the blinking HI (of the final value).

Step 9 Set the final value using the following keys.

**[^]** key Adjusts the value of the flashing of a figure.

**[<]** key Selects a different flashing figure.

Step 10 Press the **[ENTER]** key to store the new parameter and display the blinking OK (of preliminary value).

Step 11 Set the preliminary value using the following keys.

**[^]** key Adjusts the value of the flashing of a figure.

**[<]** key Selects a different flashing figure.

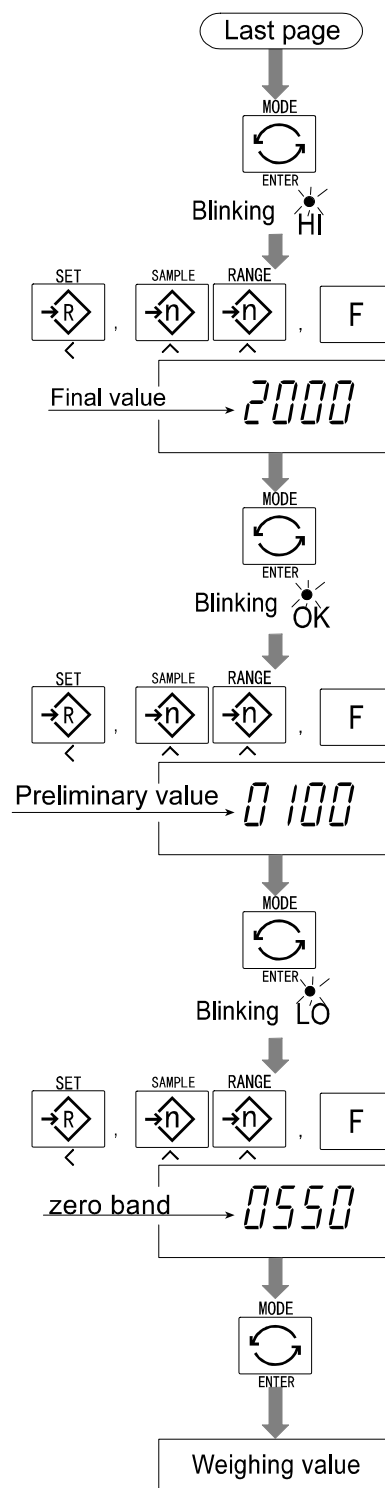
Step 12 Press the **[ENTER]** key to store the new parameter and display the blinking LO (of zero band).

Step 13 Set a zero band which is greater than the tare value, using the following keys.

**[^]** key Adjusts the value of the flashing of a figure.

**[<]** key Selects a different flashing figure.

Step 14 Press the **[ENTER]** key to store the new parameter and return to the weighing mode.

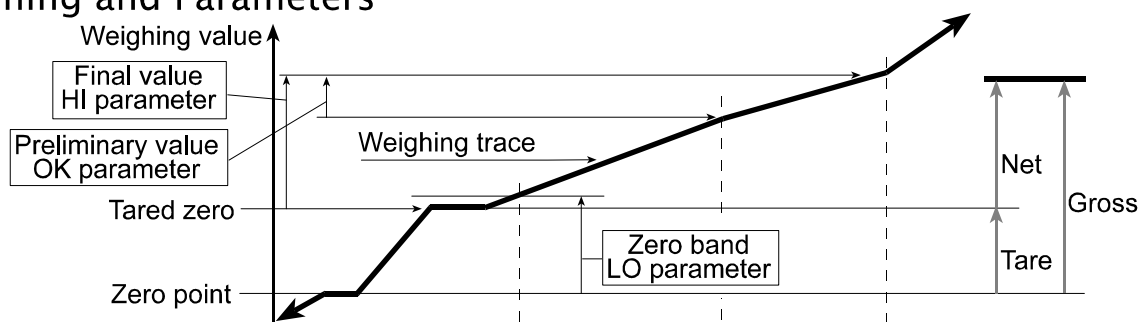




## 13. Simple Batch Function

- This function compares a display value with the final value, preliminary value and zero band for the full/dribble batch function. The result is indicated by zero band (LO indicator), full flow (HI indicator) and dribble flow (OK indicator). Even if a weighing value includes increase and decrease, this function can compare it.
- Set the parameters of the "simple batch function (  $\boxed{\text{f6}} \boxed{8}$  )", in the function table, final value (HI), preliminary value (OK) and zero band (LO), in advance, to use this function.
- Install option OP-03 or OP-04, to use the relay output of the comparison.
- Install option OP-03, to use the buzzer output of the comparator.

### Weighing and Parameters



### Indicator and Output

Zero band, LO indicator	ON	OFF	OFF	OFF
LO relay output	Make	Break	Break	Break
Preliminary, OK indicator	OFF	OFF	ON	ON
OK relay output	Break	Break	Make	Make
Final, HI indicator	OFF	OFF	OFF	ON
HI relay output	Break	Break	Break	Make

### Comparison Condition

Gross	<	Zero band	.....LO is displayed and output.
Final - Preliminary	≤	Net	.....OK is displayed and output.
Final	≤	Net	.....OK, HI is displayed and output.

### Parameter List and Word Definition

- The term "gross" is a total measurement value where the tare value is not subtracted.
- The term "net" is a measurement value with a tare value subtracted from the gross.
- The term "tare" is an item put on the weighing pan and its mass is subtracted from the gross.
- The term "zero band" is the zero detection level.
- The term "zero point" is the fundamental starting point to weigh anything.

Function table	Meaning and purpose
$\boxed{\text{f6}} \boxed{8}$	Simple batch function

## Caution

- The parameters of the upper limit value (HI) and a final value (HI) use the same memory. The parameters of the lower limit value (LO) and the zero band (LO) use the same memory.
- The upper/lower comparator function, the simple batch function and the full/dribble batch function can not be used at the same time because these parameters use common memory.



## 13.1. Preparation (Setting Parameters)

Step 1 Turn off the display.

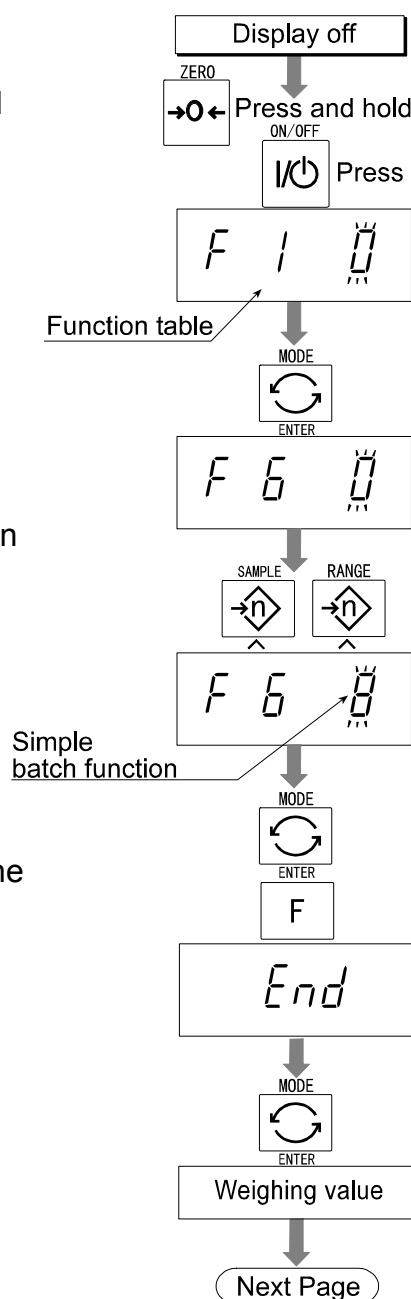
Press the **ON/OFF** key while the **ZERO** key is pressed and held. F1 is displayed.

Step 2 Press the **ENTER** key repeatedly to display F6.

Step 3 Select a parameter of 8 for the simple batch function with the **▲** key.

Step 4 Press the **ENTER** key to store the new parameter.

Step 5 Press the **F** key and the **ENTER** key to exit from the function table. The scale returns to the weighing mode.





Step 6 Press the **[MODE]** key to display the blinking HI (of the final value).

Step 7 Set the final value using the following keys.

**[ $\Delta$ ]** key Adjusts the value of a figure.  
**[<]** key Selects a figure.

Step 8 Press the **[ENTER]** key to store the new parameter and display the blinking OK (of preliminary value).

Step 9 Set the preliminary value using the following keys.

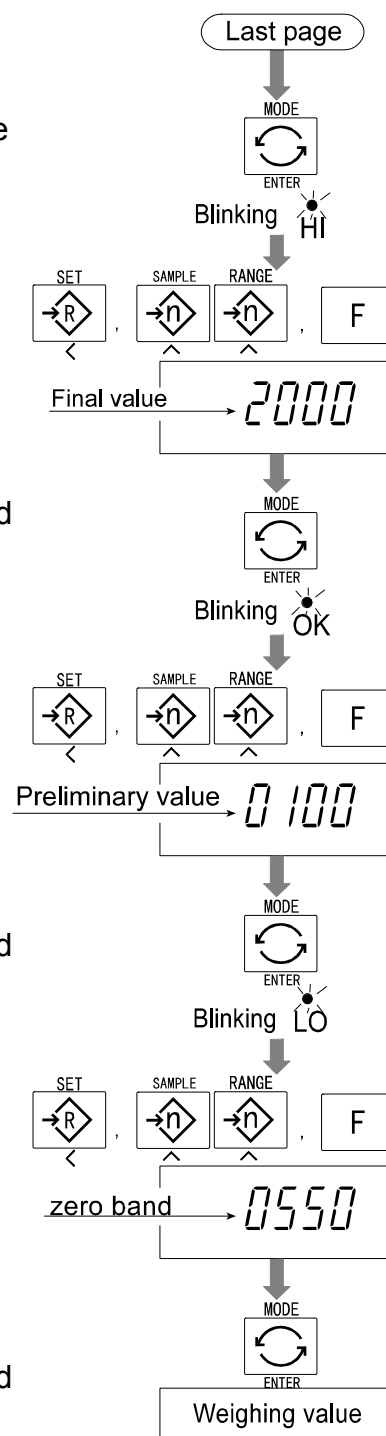
**[ $\Delta$ ]** key Adjusts the value of a figure.  
**[<]** key Selects a figure.

Step 10 Press the **[ENTER]** key to store the new parameter and display the blinking LO (of zero band).

Step 11 Set the zero band using the following keys.

**[ $\Delta$ ]** key Adjusts the value of a figure.  
**[<]** key Selects a figure.

Step 12 Press the **[ENTER]** key to store the new parameter and return to the weighing mode.



## 13.2. Operation and Performance (Examples)

Step 1 Select the parameter **[f6 8]** of the function table.

Step 2 Set the parameters of the final value, preliminary value and zero band.

Step 3 The comparison result is always displayed.



## 14. Calibration (Adjusting the Scale)

- The scale is an instrument which measures the "weight" and displays its "mass" value. Calibration is the adjustment function so that the scale can weigh correctly.

- Three steps of calibration are available

**Gravity Acceleration Correction**      The function to correct the scale's local gravity acceleration, so that the scale functions correctly when the calibrated scale has been moved to a distant place

**Calibration of the Zero Point .....** The function to adjust the zero point, so that the zero point mark is displayed when there is nothing on the pan.

Comment      The zero point is the fundamental starting point to weigh anything and influences the performance of scale.

**Span Calibration.....** The function to adjust the span with a calibrated mass, so the scale can accurately weigh anything within the weighing capacity.

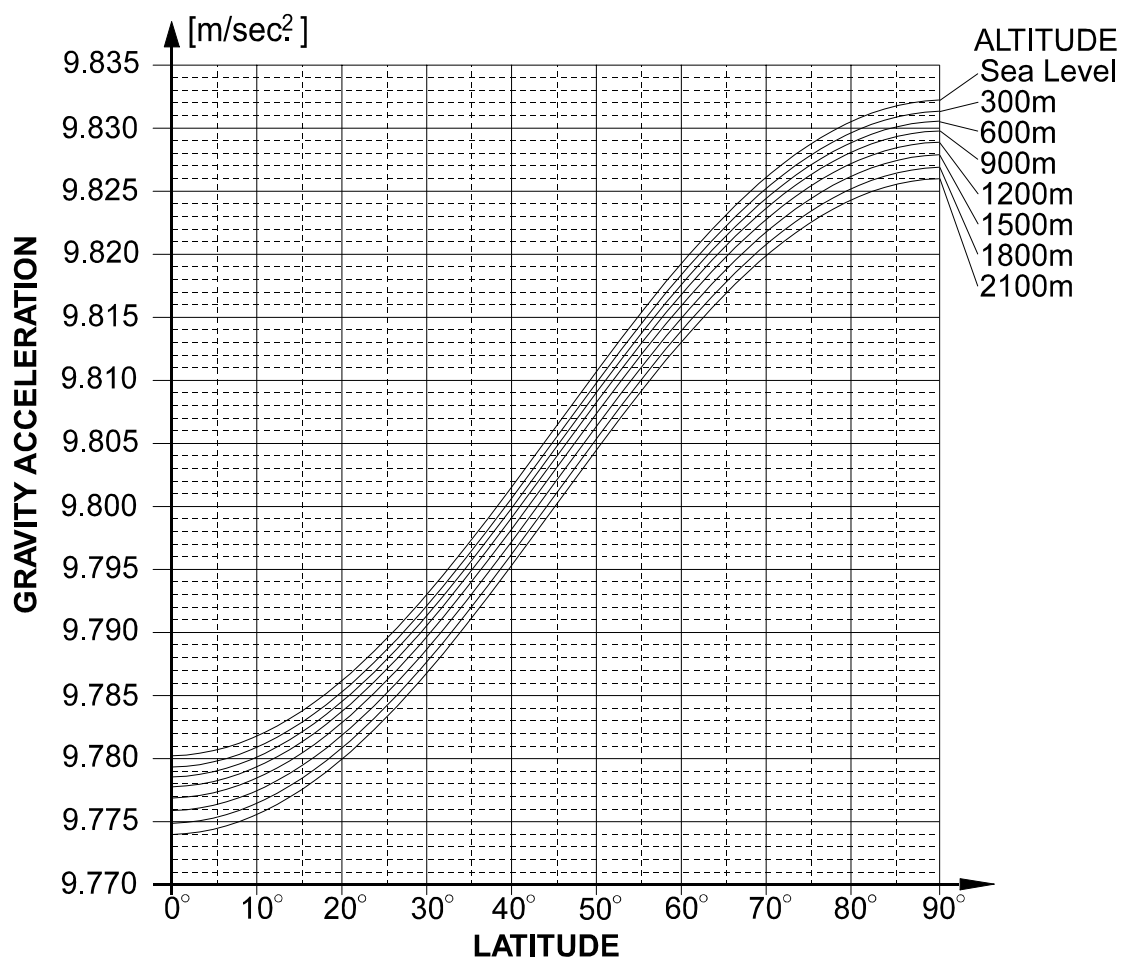
Comment      Span means the range of weighing capacity. Use a calibration mass heavier than two thirds of the weighing capacity.

### Caution

- **Calibrate the HVG-WP series, a mass of the OIML class M1 or equivalent is required.**
- **Check the accuracy of weighing periodically. Calibrate the scale, if it has been moved to another location or the environment has changed.**
- **Gravity acceleration correction is not required, when the scale is calibrated with a calibration mass at the place where the scale is used.**

## 14.1.1. The Gravity Acceleration Table

Amsterdam	9.813 m/s <sup>2</sup>	Manila	9.784 m/s <sup>2</sup>
Athens	9.800 m/s <sup>2</sup>	Melbourne	9.800 m/s <sup>2</sup>
Auckland NZ	9.799 m/s <sup>2</sup>	Mexico City	9.779 m/s <sup>2</sup>
Bangkok	9.783 m/s <sup>2</sup>	Milan	9.806 m/s <sup>2</sup>
Birmingham	9.813 m/s <sup>2</sup>	New York	9.802 m/s <sup>2</sup>
Brussels	9.811 m/s <sup>2</sup>	Oslo	9.819 m/s <sup>2</sup>
Buenos Aires	9.797 m/s <sup>2</sup>	Ottawa	9.806 m/s <sup>2</sup>
Calcutta	9.788 m/s <sup>2</sup>	Paris	9.809 m/s <sup>2</sup>
Chicago	9.803 m/s <sup>2</sup>	Rio de Janeiro	9.788 m/s <sup>2</sup>
Copenhagen	9.815 m/s <sup>2</sup>	Rome	9.803 m/s <sup>2</sup>
Cyprus	9.797 m/s <sup>2</sup>	San Francisco	9.800 m/s <sup>2</sup>
Djakarta	9.781 m/s <sup>2</sup>	Singapore	9.781 m/s <sup>2</sup>
Frankfurt	9.810 m/s <sup>2</sup>	Stockholm	9.818 m/s <sup>2</sup>
Glasgow	9.816 m/s <sup>2</sup>	Sydney	9.797 m/s <sup>2</sup>
Havana	9.788 m/s <sup>2</sup>	Taiwan	9.788 m/s <sup>2</sup>
Helsinki	9.819 m/s <sup>2</sup>	Taipei	9.790 m/s <sup>2</sup>
Kuwait	9.793 m/s <sup>2</sup>	Tokyo	9.798 m/s <sup>2</sup>
Lisbon	9.801 m/s <sup>2</sup>	Vancouver, BC	9.809 m/s <sup>2</sup>
London (Greenwich)	9.812 m/s <sup>2</sup>	Washington DC	9.801 m/s <sup>2</sup>
Los Angeles	9.796 m/s <sup>2</sup>	Wellington NZ	9.803 m/s <sup>2</sup>
Madrid	9.800 m/s <sup>2</sup>	Zurich	9.807 m/s <sup>2</sup>





## 14.2. The Complete Calibration Procedure

### 14.2.1. Gravity Acceleration Correction

- Step 1 Turn on the display.  
Open the rear cal cover of the display unit.  
Press and hold the **[CAL]** key to enter the calibration mode.  
Then **[Cal 0]** is displayed.

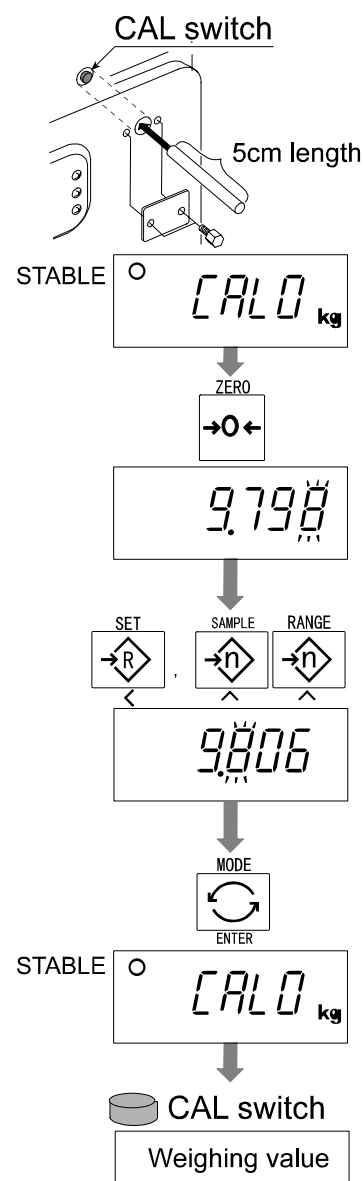
- Step 2 Press the **[ZERO]** key to enter the gravity acceleration correction mode.

- Step 3 Set your local gravity acceleration using the following keys.

**[Δ]** key      Selecting the number of a figure.  
**[<]** key      Selecting a figure.

- Step 4 Press the **[ENTER]** key to store the new value.

- Step 5 Press the **[CAL]** key again. Then the scale returns to the normal weighing mode.



### 14.2.2. Preparation

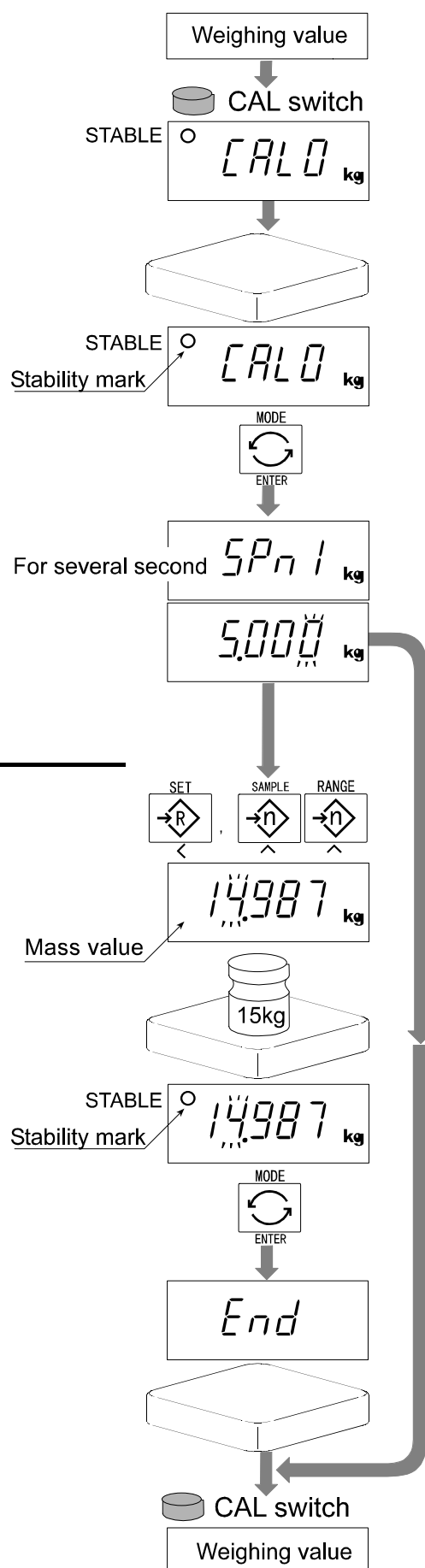
- Step 6 Confirm the environmental conditions as follows:  
Maintain a constant temperature and stable power.  
Install the scale on a solid floor where there is no draft, vibration, strong magnetic fields or direct sunlight.  
Consider section "4. Caution".
- Step 7 Display normal weighing for at least 30 minutes to warm up the scale.

## 14.2.3. Calibration of the Zero Point

Step 8 After 30-minute warm up, press and hold the **[CAL]** key to enter the calibration mode. Then **[Cal 0]** is displayed

Step 9 Confirm that nothing is placed on the pan. Wait for the stability mark to be displayed. Press the **[ENTER]** key. The scale stores the current condition as the zero point.

Step 10 The scale displays **[5pn1]** for several seconds. Calibration of zero point is finished. To exit the calibration mode, proceed to step 14.



## 14.2.4. Span Calibration

Step 11 Set the value of the calibration mass using the following keys (This initial value depends on the scale mode).

- [^]** key      Selecting the figure to be changed.
- [<]** key      Change the number of the figure.

Step 12 Place the mass on the pan which was set at step 11. Wait for the stability mark to be displayed. Press the **[ENTER]** key. The scale then calculates the span and stores it.

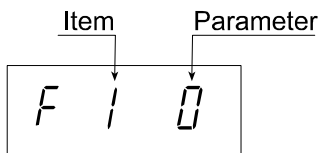
Step 13 The scale displays **[End]** at the finish. Remove the mass from the weighing pan.

Step 14 Press the **[CAL]** key to return to the normal weighing mode.



## 15. The Function Table

- The function table is the function to store and refer items that determine the performance of the scale. Each item has a parameter.
- The parameters are maintained even without power applied.



### 15.1. The Procedure for Setting Parameters

Step 1 Turn off the display.

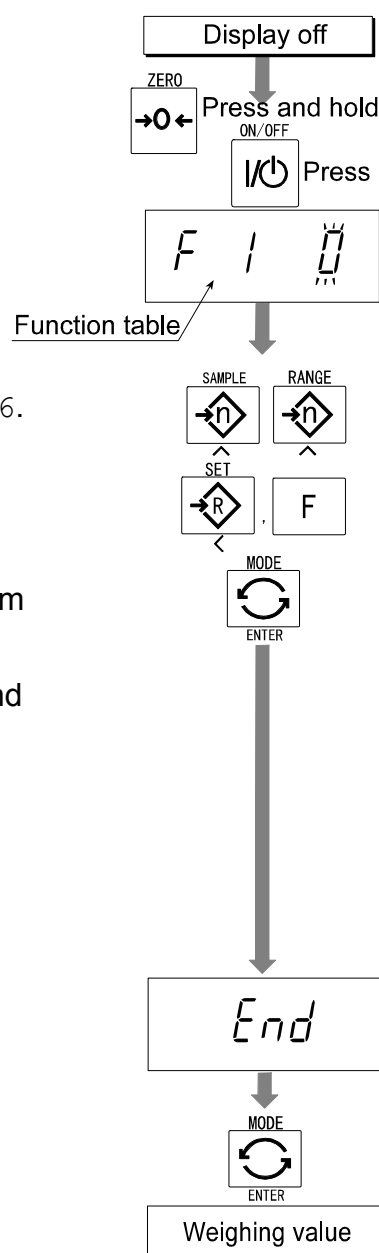
Press and hold the **ZERO** key and press the **ON/OFF** key.

Step 2 Set parameters for each item using the following keys.

- |                  |   |
|------------------|---|
| <b>△</b> key     | Selecting the parameter of an item.                                       |
| <b>&lt;</b> key  | Selecting the number of a figure at f16.                                  |
| <b>F</b> key     | Selecting a figure at f16..   |
| <b>ENTER</b> key | Proceeding to the end of the table without storing the parameter.         |
|                  | Storing a parameter for the current item and proceeding to the next item. |
|                  | Returning to normal mode from the end of the table.                       |

Step 3 Press the **ENTER** key to return to the normal mode, when **end** is displayed.

Note Pressing the **ENTER** key at step 2, the parameter is stored in the scale.





## 15.2. Parameter List

Item	Display	Description
Automatic display OFF		The type L scale is turned off after 5 minutes of no operation, when display zero. With type V, the display comes off, but the power is connected.
	f1 0 #	Not used
	f1 1	Used
Weighing range		Selects the way of changing weighing range for HV-WP series.
	f2 0 #	Automatic range
	f2 1	Manual range using the <b>[RANGE]</b> key.
Unit		Selection of the first unit at the time when the scale turns on.
	f3 0 #	kg
	f3 1	lb
	f3 2	oz
	f3 3	lb-oz
Baud rate		Transmission rate of the serial interface (RS-232C/ 422/485).
	f4 0 #	2400bps
	f4 1	4800bps
	f4 2	9600bps
Output mode		Mode selection for the serial interface (RS-232C/ 422/485).
	f5 0 #	Stream mode. (Refer to "16.2 Stream Mode")
	f5 1	Command mode. (Refer to "16.3 Command Mode")
	f5 2	Data is output, when the <b>[PRINT]</b> key is pressed.
	f5 3	Auto-print + When the display becomes a positive stable value and not nearly-zero, the scale outputs the data automatically. Next output can be performed after the display becomes nearly-zero or a negative value.
	f5 4	Auto-print +/- When the display becomes a stable value and not nearly-zero, the scale outputs the data automatically. Next output can be performed after the display becomes nearly-zero.
	f5 5	At each finish of full/dribble batch function, the data is output.
Comparator		
	f6 0 #	Pressing the <b>[SET]</b> key, the scale always compares the current display value.
	f6 1	The scale always compares the display value.
	f6 2	Pressing the <b>[SET]</b> key, the scale always compares the display value when not nearly-zero.
	f6 3	The scale always compares the display value when not nearly-zero.
	f6 4	When the weight value becomes stable after pressing the <b>[SET]</b> key, the scale compares the display value. It does not compare on an unstable condition. Press the <b>[SET]</b> key again to stop the comparison.

"#" factory settings. The "nearly-zero" is within  $\pm 4$  digits from zero point in the unit of kg.

Item	Display	Description
Comparator	£6 5	When the weight value becomes stable, the scale compares the display value. It does not compare on an unstable condition.
	£6 6	When the display value becomes stable when not nearly-zero after pressing the <b>[SET]</b> key, the scale compares the display value. It does not compare on an unstable condition. If the <b>[SET]</b> key is pressed again, the scale stops the comparison.
	£6 7	When the display value becomes stable when not nearly-zero, the scale compares the value.
	£6 8	Simple batch function. (Refer to section 13.)
	£6 9	Full/dribble batch function. (Refer to section 12.)
Buzzer	The condition of the buzzer on option OP-03 by comparator function or full/dribble batch function.	
	£7 0 #	No buzzer.
	£7 1	The buzzer sounds at LO.
	£7 2	The buzzer sounds at OK.
	£7 3	The buzzer sounds at LO and OK.
	£7 4	The buzzer sounds at HI.
	£7 5	The buzzer sounds at LO and HI.
	£7 6	The buzzer sounds at OK and HI.
	£7 7	The buzzer sounds at LO, OK and HI.
	£7 8	The buzzer sounds at finishing the full/dribble batch process.
Accumulation function	The condition of the accumulation function	
	£8 0 #	Accumulation function not used.
	£8 1	The scale accumulates the data, if the <b>[F]</b> key is pressed, when the display becomes a positive stable value and not nearly-zero. The next accumulation can be performed after the display becomes nearly-zero or a negative value.
	£8 2	The scale accumulates the data, if the <b>[F]</b> key is pressed, when the display becomes a stable value and not nearly-zero. The next accumulation can be performed after the display becomes nearly-zero.
	£8 3	When the display is a positive stable value and not nearly zero, the scale accumulates the data automatically. The next accumulation can be performed after the display becomes nearly-zero or a negative value.
	£8 4	When the display becomes a stable value and not nearly zero, the scale accumulates the data automatically. Next accumulation can be performed after the display becomes nearly-zero. Use recording number and mass of articles removed from the weighing pan. (Place the articles on the weighing pan. Press <b>[TARE]</b> key at each removal.)



Item	Display	Description
	f8 5	At each finish of the full/dribble batch function, the scale accumulates the data automatically. Use Packing articles like a powder. used for recording the bag number and total mass.
Full/Dribble batch sub-function	Select the details of the full/dribble batch function (f6 9)	
	f10 0 #	When the <span>[F]</span> key is pressed after final value is reached, the current process is finished.
	f10 1	When the stability mark is displayed after final value is reached, the current process is finished.
	f10 2	When the <span>[SET]</span> key is pressed, the scale automatically tares and starts the full/dribble batch process. When the <span>[F]</span> key is pressed after final value is reached, the current process is finished.
	f10 3	When the <span>[SET]</span> key is pressed, the scale automatically tares and starts the full/dribble batch process. When the stability mark is displayed after final value is reached, the current process is finished.
Address	Select the address for RS-422 / RS-485 for option OP-04	
	f11 1 # ~ f11 99	Use addresses from 01 to 99 are available. Scales are assigned unique addresses and are controlled by the computer. (RS-232C should be set to "00".)
Hold	Select the method to hold the current weight value. When the weight value becomes nearly-zero or changes more than more than 25% +30 digits, hold display is canceled.	
	f12 0 #	Not used
	f12 1	The hold function is ON or OFF alternately by the <span>[F]</span> key.
	f12 2	When the stability mark is displayed, the display is held.
Averaging	Select readability and response	
	f13 0 #	Fast response, sensitive value. ⇕ Slow response, stable value.
	f13 1	
	f13 2	
Precision of unit mass	Select a storable minimum unit mass in the counting mode.	
	f14 0 #	Stores a unit mass in the unit of a digit.
	f14 1	Stores a unit mass in the unit of one-eighth digit.
	f14 2	Stores a unit mass, if the total of the sample mass is greater than 5 digits.
Format	Refer to "16.1. Data Format".	
	f15 0 #	Format 1. (A&D general format for scales, balances)
	f15 1	Format 2. (Older HV-A/ HW-A format)
	f16	Not used.

"#" factory settings

The "nearly-zero" is within  $\pm 4$  digits from zero point in the unit of kg.

The "digit", a unit of display, is equivalent to the minimum measurable mass.



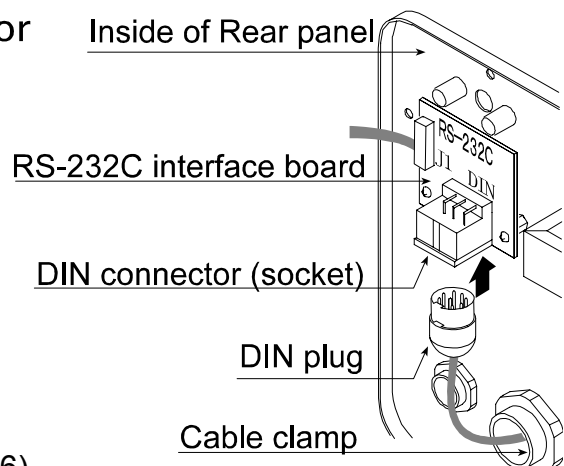
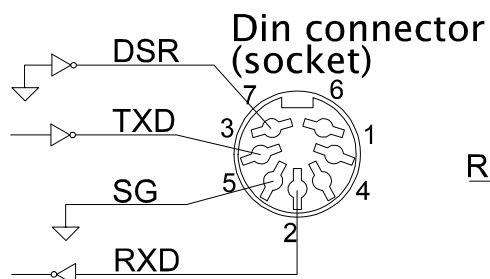
## 16. RS-232C Serial Interface

Note When the RS-232C serial interface is used, be sure to set the "Address (  )" to "(  )".

- The RS-232C interface has the following two modes.
  - Stream mode      Outputs data continuously and can be used for printing data.
  - Command mode    Controls the scale using commands from a computer.
- Set the parameters for the "Baud rate (  )", " Output mode (  )" and " Format (  )", in the function table, in advance.
- There are option cables as follows:
  - AX-KO577A      RS-232C cable, D-sub 25 pin, 2m
  - AX-KO1786-200    RS-232C cable, D-sub 9 pin, 2m
- Transmission system    EIA RS-232C
- Transmission            Asynchronous, bi-directional, half-duplex
- Data format              Baud rate:    2400, 4800, 9600 bps  
Data:            7 bits  
Parity:          1 bit, Even  
Start bit        1 bit  
Stop bit        1 bit  
Code            ASCII  
Terminator     CR LF    (CR: 0Dh, LF: 0Ah)
- Pin connections

Pin No.	Signal name	Direction	Description
1	-		
2	RXD	Input	Receive data
3	TXD	Output	Transmit data
4	-		
5	SG	-	Signal ground
6	-		
7	DSR	Output	Data set ready

- Circuits

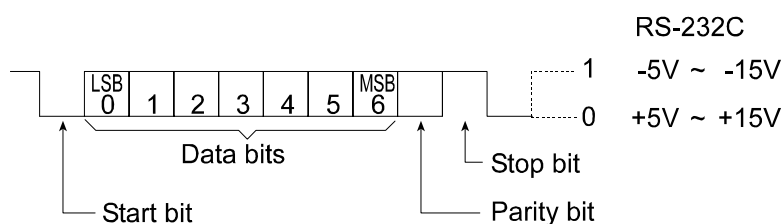


- Adaptable connector    DIN 7pin, (TCP0576)



## 16.1. Data Format

### Bit Format



### Format 1

- There are four headers for the type of data and weighing condition.
 

Stable weighing data	<span>S</span> <span>T</span>	Unstable weighing data	<span>U</span> <span>S</span>
Stable counting data	<span>Q</span> <span>T</span>	Out of range ( Over)	<span>O</span> <span>L</span>
- The weighing data consists of 9 characters including decimal point and polarity.
- The polarity is always output.
- There are three units. The unit is 3 characters.
- In case of "out of range", numbers become all 9's.
- The terminator is always output as CR LF.

Data in the unit of kg

S	T	,	+	0	0	0	1	2	.	4	0		k	g	C <sub>R</sub>	L <sub>F</sub>
Header			Weighing value										unit		Terminator	

Counting mode

Q	T	,	+	0	0	0	0	3	0	0	0		P	C	C <sub>R</sub>	L <sub>F</sub>
Header			Weighing value										unit		Terminator	

Percentage mode

S	T	,	+	0	0	0	3	0	0	.	0			%	C <sub>R</sub>	L <sub>F</sub>
Header			Weighing value										unit		Terminator	

Out of range

O	L	,	+	9	9	9	9	9	.	9	9		k	g	C <sub>R</sub>	L <sub>F</sub>
Header			Weighing value										unit		Terminator	

Polarity

- Definition of symbols
 

CR (carriage return)	<span>C<sub>R</sub></span>	LF (line feed)	<span>L<sub>F</sub></span>
0Dh		0Ah	
Space	<span></span>		
20h			

## Format 2

- There are four headers for the type of data and weighing condition.
 

Stable weighing data	<span style="border: 1px solid black; padding: 0 2px;">S</span> <span style="border: 1px solid black; padding: 0 2px;">T</span>	Unstable weighing data	<span style="border: 1px solid black; padding: 0 2px;">U</span> <span style="border: 1px solid black; padding: 0 2px;">S</span>
Stable counting data	<span style="border: 1px solid black; padding: 0 2px;">Q</span> <span style="border: 1px solid black; padding: 0 2px;">T</span>	Out of range	<span style="border: 1px solid black; padding: 0 2px;">O</span> <span style="border: 1px solid black; padding: 0 2px;">L</span>
- The weighing data consists of 7 characters including decimal point and polarity. The data consists of 7 characters in the counting mode.
- The polarity is always output.
- There are three units. The unit is 2 characters.
- In case of "out of range", numbers become all 9's.
- The terminator is always output as CR LF.

## Caution

**When the data is longer than 7 characters in the counting, percentage mode or accumulation function, the overflow is ignored.**

Data in the unit of kg	<div style="border: 1px solid black; display: inline-block; padding: 2px;"> <span style="border: 1px solid black; padding: 0 2px;">S</span><span style="border: 1px solid black; padding: 0 2px;">T</span><span style="border: 1px solid black; padding: 0 2px;">,</span><span style="border: 1px solid black; padding: 0 2px;">+</span><span style="border: 1px solid black; padding: 0 2px;">0</span><span style="border: 1px solid black; padding: 0 2px;">0</span><span style="border: 1px solid black; padding: 0 2px;">2</span><span style="border: 1px solid black; padding: 0 2px;">.</span><span style="border: 1px solid black; padding: 0 2px;">4</span><span style="border: 1px solid black; padding: 0 2px;">0</span><span style="border: 1px solid black; padding: 0 2px;">k</span><span style="border: 1px solid black; padding: 0 2px;">g</span><span style="border: 1px solid black; padding: 0 2px;">C<sub>R</sub></span><span style="border: 1px solid black; padding: 0 2px;">L<sub>F</sub></span> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <span>Header</span><span>Weighing value</span><span>unit</span><span>Terminator</span> </div>
Counting mode	<div style="border: 1px solid black; display: inline-block; padding: 2px;"> <span style="border: 1px solid black; padding: 0 2px;">Q</span><span style="border: 1px solid black; padding: 0 2px;">T</span><span style="border: 1px solid black; padding: 0 2px;">,</span><span style="border: 1px solid black; padding: 0 2px;">+</span><span style="border: 1px solid black; padding: 0 2px;">0</span><span style="border: 1px solid black; padding: 0 2px;">0</span><span style="border: 1px solid black; padding: 0 2px;">3</span><span style="border: 1px solid black; padding: 0 2px;">0</span><span style="border: 1px solid black; padding: 0 2px;">0</span><span style="border: 1px solid black; padding: 0 2px;">0</span><span style="border: 1px solid black; padding: 0 2px;">P</span><span style="border: 1px solid black; padding: 0 2px;">C</span><span style="border: 1px solid black; padding: 0 2px;">C<sub>R</sub></span><span style="border: 1px solid black; padding: 0 2px;">L<sub>F</sub></span> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <span>Header</span><span>Weighing value</span><span>unit</span><span>Terminator</span> </div>
Percentage mode	<div style="border: 1px solid black; display: inline-block; padding: 2px;"> <span style="border: 1px solid black; padding: 0 2px;">S</span><span style="border: 1px solid black; padding: 0 2px;">T</span><span style="border: 1px solid black; padding: 0 2px;">,</span><span style="border: 1px solid black; padding: 0 2px;">+</span><span style="border: 1px solid black; padding: 0 2px;">0</span><span style="border: 1px solid black; padding: 0 2px;">3</span><span style="border: 1px solid black; padding: 0 2px;">0</span><span style="border: 1px solid black; padding: 0 2px;">0</span><span style="border: 1px solid black; padding: 0 2px;">.</span><span style="border: 1px solid black; padding: 0 2px;">0</span><span style="border: 1px solid black; padding: 0 2px;">_</span><span style="border: 1px solid black; padding: 0 2px;">%</span><span style="border: 1px solid black; padding: 0 2px;">C<sub>R</sub></span><span style="border: 1px solid black; padding: 0 2px;">L<sub>F</sub></span> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <span>Header</span><span>Weighing value</span><span>unit</span><span>Terminator</span> </div>
Out of range	<div style="border: 1px solid black; display: inline-block; padding: 2px;"> <span style="border: 1px solid black; padding: 0 2px;">O</span><span style="border: 1px solid black; padding: 0 2px;">L</span><span style="border: 1px solid black; padding: 0 2px;">,</span><span style="border: 1px solid black; padding: 0 2px;">+</span><span style="border: 1px solid black; padding: 0 2px;">9</span><span style="border: 1px solid black; padding: 0 2px;">9</span><span style="border: 1px solid black; padding: 0 2px;">9</span><span style="border: 1px solid black; padding: 0 2px;">.</span><span style="border: 1px solid black; padding: 0 2px;">9</span><span style="border: 1px solid black; padding: 0 2px;">9</span><span style="border: 1px solid black; padding: 0 2px;">k</span><span style="border: 1px solid black; padding: 0 2px;">g</span><span style="border: 1px solid black; padding: 0 2px;">C<sub>R</sub></span><span style="border: 1px solid black; padding: 0 2px;">L<sub>F</sub></span> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <span>Header</span><span>Polarity</span><span></span><span></span> </div>

- Definition of symbols
 

CR (carriage return)	<span style="border: 1px solid black; padding: 0 2px;">C<sub>R</sub></span>	LF (line feed)	<span style="border: 1px solid black; padding: 0 2px;">L<sub>F</sub></span>
0Dh		0Ah	
Space	<span style="border: 1px solid black; padding: 0 2px;">_</span>		
20h			

## 16.2. Stream Mode

- The scale outputs the current weighing data at the time when the display is refreshed. The scale does not output data while in the setting mode.

Averaging of function table		Refresh rate
f13 0	Fast response Sensitive value	Approximately 7 times/s while the display is unstable, Approximately 4 times/s when the display is stable
f13 1	⇕	
f13 2	Slow response Stable value	Approximately 4 times/s

### 16.2.1. Preparation and Performance (Examples)

Step 1 Turn off the display.

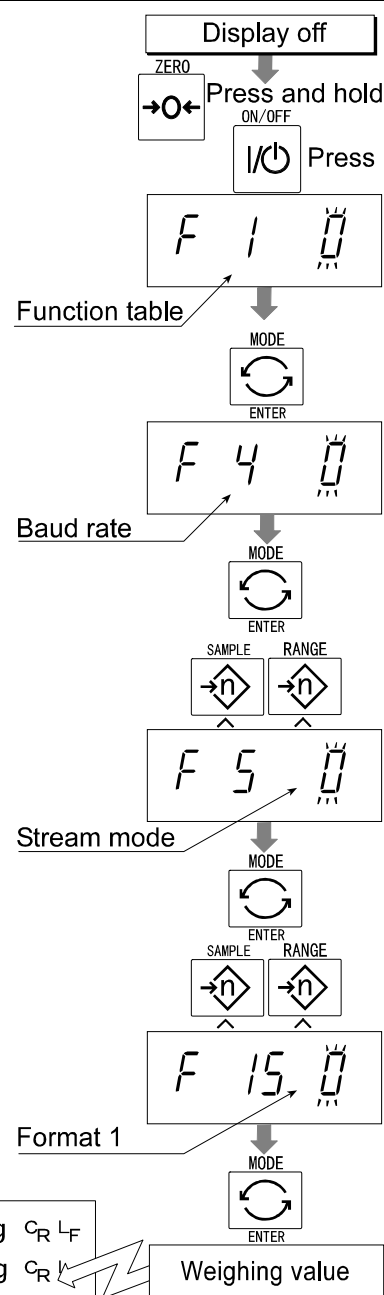
Press and hold the **ZERO** key and press the **ON/OFF** key. The function table is displayed.

Step 2 Press the **ENTER** key to display **f4** ("Baud rate").  
Select a parameter of "Baud rate" with the **Δ** keys.

Step 3 Press the **ENTER** key to display **f5** ("output mode").  
Select "Stream mode ( **f5 0** )" with the **Δ** keys.

Step 4 Press the **ENTER** key to display **f15** ("Format").  
Select "Format 1 ( **f15 0** )" with the **Δ** keys

Step 5 Press the **ENTER** key to store the new parameters.  
The scale returns the normal weighing and outputs the data continuously.



ST,0000.000\_kg C<sub>R</sub> L<sub>F</sub>  
 US,0010.645\_kg C<sub>R</sub> L<sub>F</sub>  
 544\_kg C<sub>D</sub> L<sub>F</sub>



## 16.3. Command mode

- The command mode is the function which can perform "output data", "controlling the scale" and "setting parameters" by a command transmitted from a computer

**Caution** Allow at least 500 milliseconds between commands.

### 16.3.1. Command List

---

The following explanation uses "format 1 ( f15 0 )"

#### Data output

The current weighing data is output.

Template Q

Command QC<sub>R</sub>L<sub>F</sub>

Reply ST,+00012.40\_kgC<sub>R</sub>L<sub>F</sub>

#### Selection of mode and unit

Selects the mode and unit. This is the same as the MODE key.

Template U

Command UC<sub>R</sub>L<sub>F</sub>

Reply The scale changes mode and unit.

#### Zero

The current mass value is set to the zero point.

This is the same as the ZERO key.

Template Z

Command ZC<sub>R</sub>L<sub>F</sub>

Reply The mass value becomes zero and the zero point mark is displayed.

#### Tare

With a tare (container) placed, the current mass value is set to zero, and the net is displayed. This is the same as the TARE key.

Template T

Command TC<sub>R</sub>L<sub>F</sub>

Reply The current mass value becomes zero and the net mark is displayed.

#### Cancel of tare

The display value becomes the gross and the net mark is turned off. (The tare value becomes zero.)

Template CT

Command CTC<sub>R</sub>L<sub>F</sub>

Reply Gross is displayed and the net mark is turned off.

## Preset tare

The tare value is set and the net value is displayed. The net mark is displayed.

Template PT, [parameter]

Command 

P	T	,	+	0	0	1	2	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	----------------	----------------

Reply Net is displayed.

## Upper limit value

An upper limit value is stored.

Template HI, [parameter]

Command 

H	I	,	+	0	1	2	0	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	----------------	----------------

Reply The upper limit value is stored.

## Lower limit value

A lower limit value is stored.

Template LO, [parameter]

Command 

L	O	,	-	0	0	4	0	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	----------------	----------------

Reply The lower limit value is stored.

**Caution** The lower limit value must be less than the upper limit value.

## Accumulation data output

The accumulated data is output.

Template A

Command 

A	C <sub>R</sub>	L <sub>F</sub>
---	----------------	----------------

Reply 

A	,	+	0	2	3	1	2	.	4	0	┐	k	g	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

## Accumulation count output

The number of accumulated data is output.

Template N

Command 

N	C <sub>R</sub>	L <sub>F</sub>
---	----------------	----------------

Reply 

N	,	+	0	0	0	0	0	1	4	0	┐	┐	┐	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

## Reset of Accumulation data and number

The data and number of accumulations become zero.

Template CA

Command 

C	A	C <sub>R</sub>	L <sub>F</sub>
---	---	----------------	----------------

Reply The data and number of accumulations become zero.

## Final value

The final value is stored.

Template S0, [parameter]

Command 

S	0	,	+	0	2	0	0	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	----------------	----------------

Reply The value is stored.

## Preliminary value

The preliminary value is stored.

Template S1, [parameter]

Command 

S	1	,	+	0	0	2	0	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	----------------	----------------

Reply The value is stored.

## Zero band

The zero band is stored.

Template S2, [parameter]

Command 

S	2	,	+	0	0	5	0	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	----------------	----------------

Reply The value is stored.



## 16.3.2. Example of Setting Parameters

Step 1 Turn off the display.

Press the **ON/OFF** key while the **ZERO** key is pressed and held. The function table is displayed.

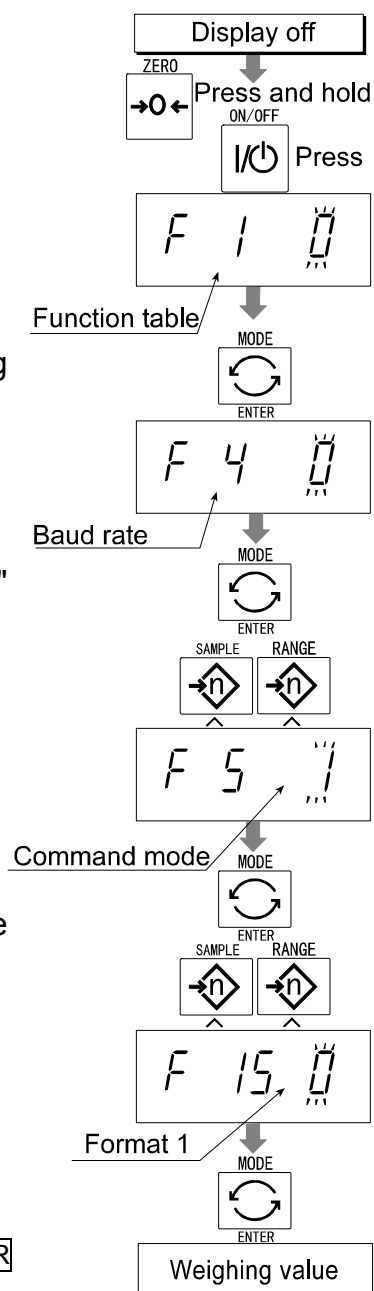
Step 2 Select a parameter for the "baud rate ( **f4** )" using the **ENTER** and **△** keys.

Step 3 Select "command mode ( **f5 1** )" for the "output" using the **ENTER** and **△** keys.

Step 4 Select "format 1 ( **f15 0** )" for the "format" using the **ENTER** and **△** keys.

Step 5 Press the **ENTER** key to store the new parameters. Return to the normal weighing mode using the **ENTER** key.

Step 6 When the computer transmits a command, the scale replies.





## 17. Options

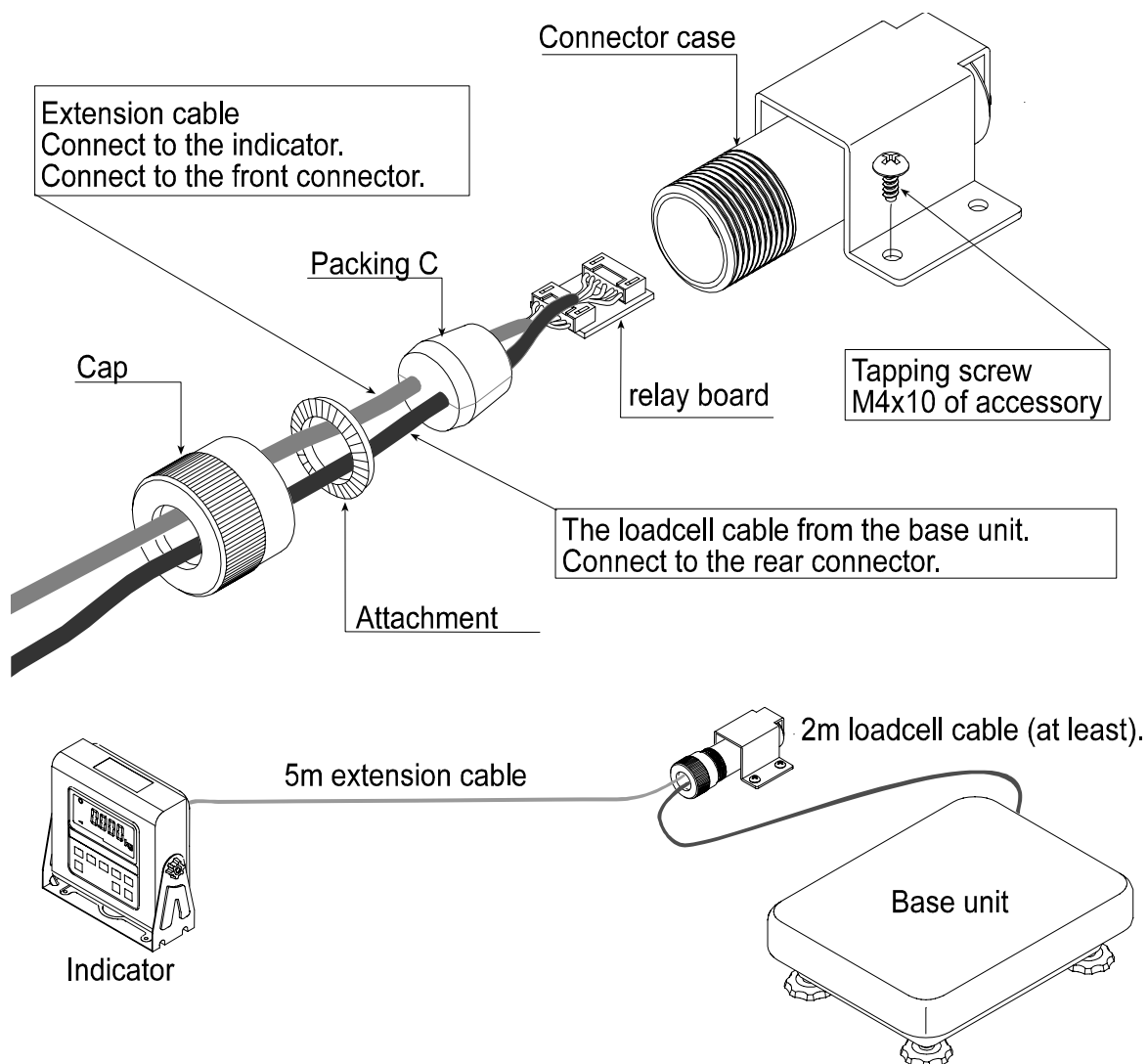


### 17.1. Extension cable (OP-02)

- This cable is used for installing the indicator away from the base unit.
- This loadcell cable is 5m long.
- Refer to " 5.1. Removing Pole" for the way to remove the pole.

#### Caution

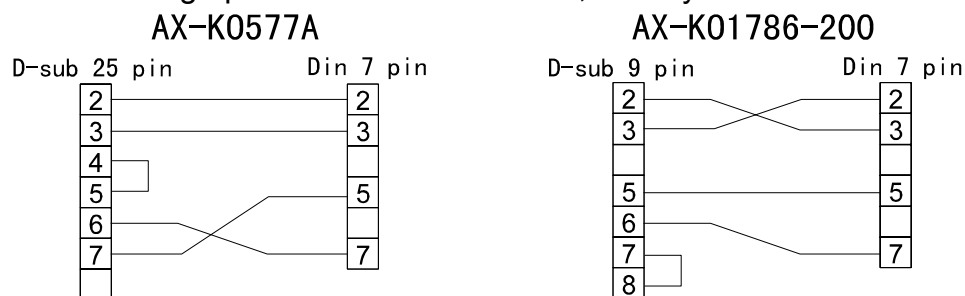
- **Calibrate the scale after connecting this cable.**
- **Do not connect more than two extension cables.**



## 17.2. RS-232C/ Relay output/ Buzzer (OP-03)

Note When the OP-03 is used, be sure to set the "Address ( f11 ) " to "( 00 )".

- This option replaces the RS-232C interface, refer to "16. RS-232C Serial Interface" for specification of RS-232C.
- The following option cables can be used, when you do not use the relay output.

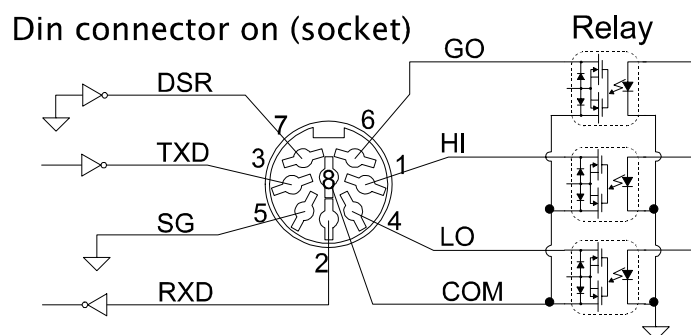


- Pin connections

Pin No.	Signal name	Direction	Description
1	HI	Output	Relay output of HI
2	RXD	Input	Receive data
3	TXD	Output	Transmit data
4	LO	Output	Relay output of LO
5	SG	-	Signal ground (RS-232C)
6	OK	Output	Relay output of OK
7	DSR	Output	Data set ready
8	COM	-	Relay common terminal

- Adaptable connector     DIN 8pin, JA:TCP0586 (of accessory)

- Circuits

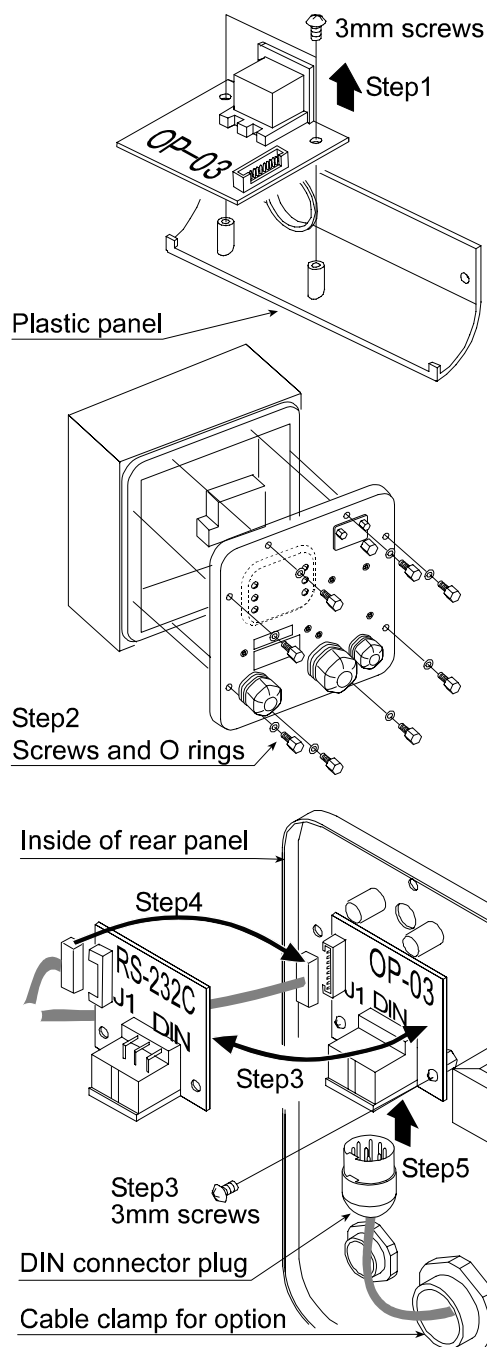


- Relay     Solid-state-relay     Maximum voltage     DC50V  
    Maximum current     DC100mA  
    Maximum resistance     8 Ω

## 17.2.1. Installing the OP-03

**Caution** Do not pull on the connected cables while opening the rear panel.

- Step 1 Remove the plastic panel from the option board.
- Step 2 Remove eight pairs of screws and O rings from the indicator unit. Open the rear panel of the unit.
- Step 3 Remove the standard interface board from the indicator unit. Install the option board at the same position.
- Step 4 Connect the cable to the J1 connector on the option board.
- Step 5 Connect the DIN plug to the option board.
- Step 6 Close and secure the rear panel using the screws and O rings removed at step 2.



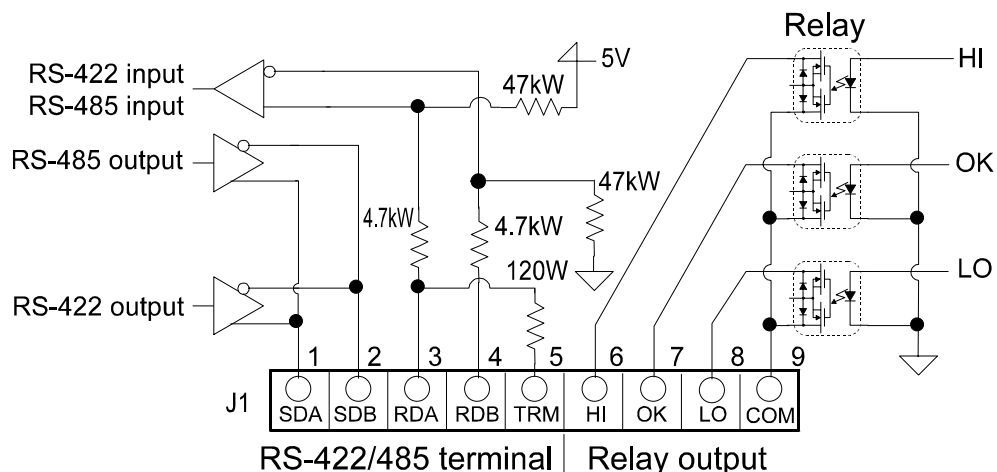


## 17.3. RS-422 / RS-485 / Relay output (OP-04)

- Replacing the RS-232C interface with this option, the RS-422/ RS-485 interface can connect up to 16 scales and control them from a computer.
- The RS-422/ RS-485 interface has the following two modes.
  - Stream mode      Outputs data continuously.
  - Command mode    Controls the scale using command from a computer.
- Set the parameters for the "Baud rate ( f4 )", " Output mode ( f5 )" and " Format ( f15 )", in the function table, in advance.
- Transmission system      EIA RS-422/ RS-485
- Transmission              Asynchronous, bi-directional, half-duplex
- Data format              Baud rate:      2400, 4800, 9600 bps  
                                 Data:              7 bits  
                                 Parity:           1 bit, Even  
                                 Start bit        1 bit  
                                 Stop bit        1 bit  
                                 Code            ASCII  
                                 Terminator    CR LF (CR: 0Dh, LF: 0Ah)
- Address                      01 ~ 99              Address parameter ( f11 ) of the function table.
- Relay                        Solid-state-relay  
                                 Maximum voltage      DC50V  
                                 Maximum current     DC100mA  
                                 Maximum resistance   8 Ω
- Adaptable connector      TM:BLA9 (of accessory)
- Pin connections

Pin No.	Signal name	Direction	Description
1	SDA	Output	RS-422/485 transmission A terminal
2	SDB	Output	RS-422/485 transmission B terminal
3	RDA	Input	RS-422/485 receive A terminal
4	RDB	Input	RS-422/485 receive B terminal
5	TRM	-	120Ω terminator
6	HI	Output	Relay output of HI
7	OK	Output	Relay output of OK
8	LO	Output	Relay output of LO
9	COM	-	Relay common terminal

## □ Circuits



### Selection key for the RS-422 / RS-485 interface

Selects either of RS-422 or RS-485 interface using a key on the board.

## 17.3.1. Installing the OP-04

**Caution** Do not pull on the connected cables while opening the rear panel.

Step 1 Remove eight pairs of screws and O rings from the indicator unit. Open the rear panel of the unit.

Step 2 Remove the standard interface board from the indicator unit. Install the option board at the same position.

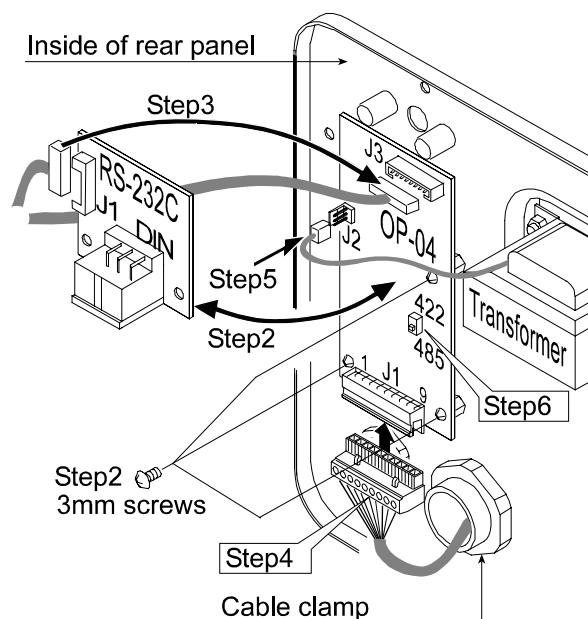
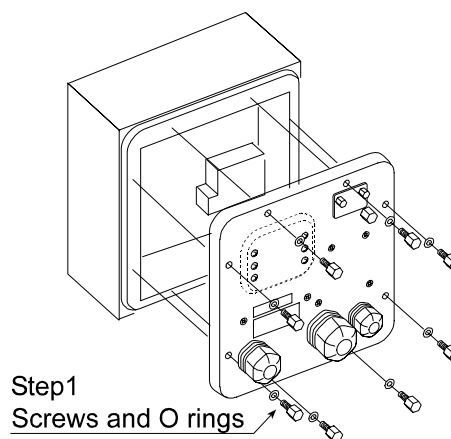
Step 3 Connect the cable to the J3 connector on the option board.

Step 4 Wire the connector for J1 and connect it to the option board.

Step 5 Connect a cable from the transformer to the J2 connector.

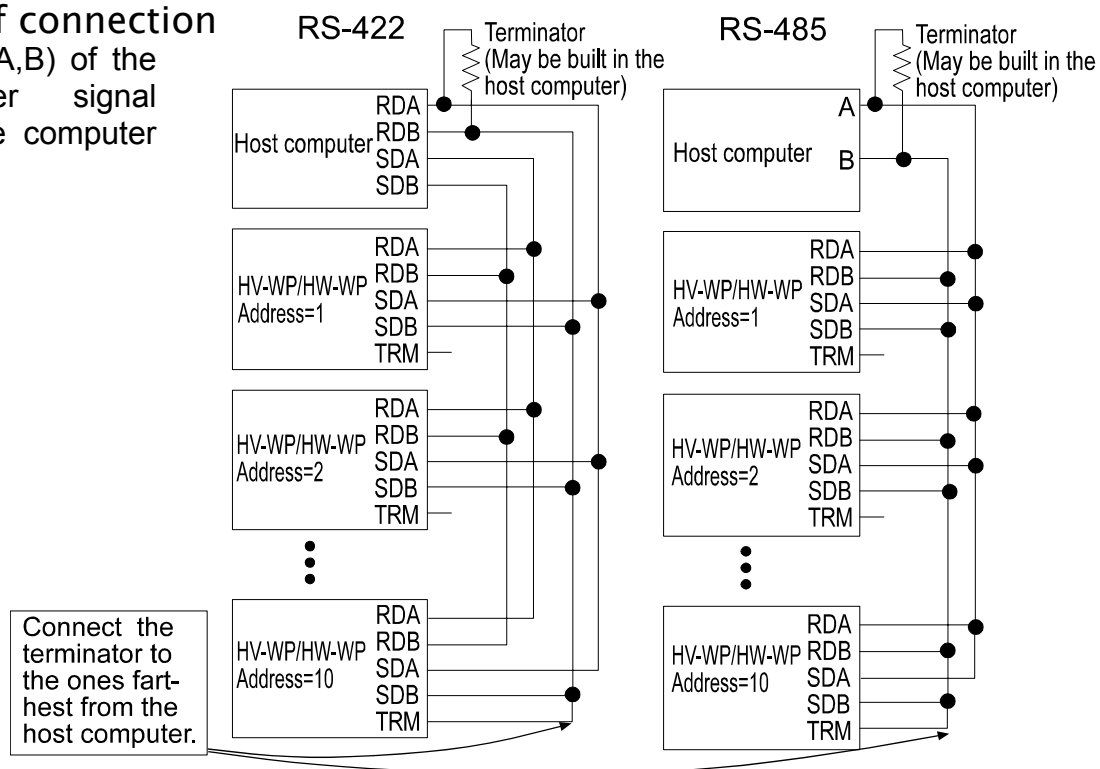
Step 6 Set a interface type with the key.

Step 7 Close and secure the rear panel using the screws and O rings removed at step 1.



## An example of connection

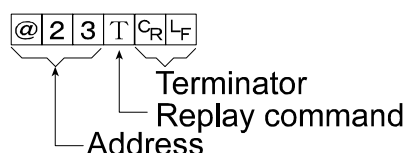
The polarities (A,B) of the host computer signal depends on the computer model.



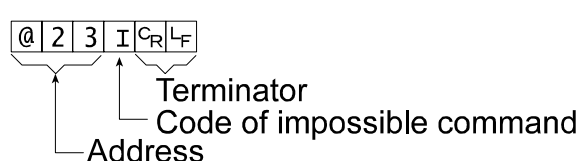
## 17.3.2. Communication Format

- Commands consist of an address and the same command as for the RS-232C.
- Commands return the same command when there is no data transmitted.
- If the address is 23, the replay is as follows:

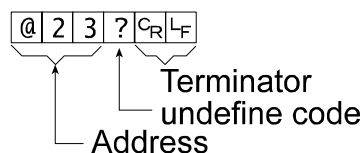
Normal response



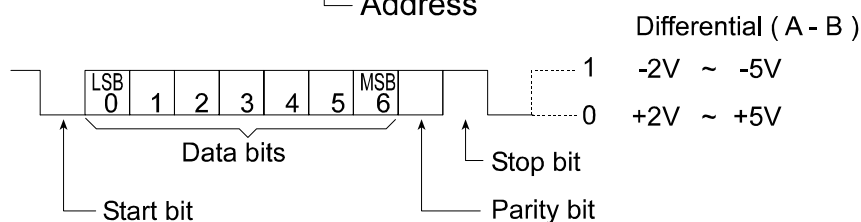
Response of impossible command



Undefined command response



Bit format



The following explanation uses "format 1 ( 

f15	0
-----	---

 )" assuming 23 as the address.

## Data output

The current weighing data is output.

Template Q

Command 

@	2	3	Q	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	----------------	----------------

Reply 

@	2	3	S	T	,	+	0	0	0	1	2	.	4	0	└	k	g	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

## Selection of mode and unit

Selects the mode and unit. This is the same as the 

MODE
------

 key.

Template U

Command 

@	2	3	U	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	----------------	----------------

Reply 

@	2	3	U	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	----------------	----------------

The scale changes mode and unit.

## Zero

The current mass value is set to the zero point.

This is the same as the 

ZERO
------

 key.

Template Z

Command 

@	2	3	Z	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	----------------	----------------

Reply 

@	2	3	Z	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	----------------	----------------

The mass value becomes zero and the zero point mark is displayed.

## Tare

The current mass value becomes zero after placing a tare (receptacle, case, etc) and the net is displayed. This is the same as the 

TARE
------

 key.

Template T

Command 

@	2	3	T	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	----------------	----------------

Reply 

@	2	3	T	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	----------------	----------------

The current mass value becomes zero and the net mark is displayed.

## Cancel of tare

The display value becomes the gross and the net mark is turned off. (The tare value becomes zero.)

Template CT

Command 

@	2	3	C	T	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	----------------	----------------

Reply 

@	2	3	C	T	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	----------------	----------------

Gross is displayed and the net mark is turned off.

## Preset tare

The tare value is set and the net value is displayed. The net mark is displayed.

Template PT, [parameter]

Command 

@	2	3	P	T	,	+	0	0	1	2	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

Reply 

@	2	3	P	T	,	+	0	0	1	2	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

Net is displayed.

## Upper limit value

An upper limit value is stored.

Template HI, [parameter]

Command 

@	2	3	H	I	,	+	0	3	2	1	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

Reply 

@	2	3	H	I	,	+	0	3	2	1	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

The upper limit value is stored.

## Lower limit value

A lower limit value is stored.

Template LO, [parameter]

17.3. OP-04, Options



Command 

@	2	3	L	0	,	-	0	0	4	0	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

  
 Reply 

@	2	3	L	0	,	-	0	0	4	0	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

  
 The lower limit value is stored.

**Caution**      The lower limit value must be less than the upper limit value.

### Accumulation data output

The accumulated data is output.

Template      A

Command 

@	2	3	A	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	----------------	----------------

Reply 

@	2	3	A	,	+	0	0	0	1	2	.	4	0	␣	k	g	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

### Accumulation count output

The number of accumulated data is output.

Template      N

Command 

@	2	3	N	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	----------------	----------------

Reply 

@	2	3	N	,	+	0	0	0	0	0	1	4	0	␣	␣	␣	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

### Reset of Accumulation data and number

The data and number of accumulations become zero.

Template      CA

Command 

@	2	3	C	A	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	----------------	----------------

Reply 

@	2	3	C	A	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	----------------	----------------

The data and number of accumulations become zero.

### Final value

The final value is stored.

Template      S0, [parameter]

Command 

@	2	3	S	0	,	+	0	2	0	0	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

Reply 

@	2	3	S	0	,	+	0	2	0	0	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

The value is stored.

### Preliminary value

The preliminary value is stored.

Template      S1, [parameter]

Command 

@	2	3	S	1	,	+	0	0	2	0	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

Reply 

@	2	3	S	1	,	+	0	0	2	0	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

The value is stored.

### Zero band

The zero band is stored.

Template      S2, [parameter]

Command 

@	2	3	S	2	,	+	0	0	0	5	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

Reply 

@	2	3	S	2	,	+	0	0	0	5	0	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

The value is stored.

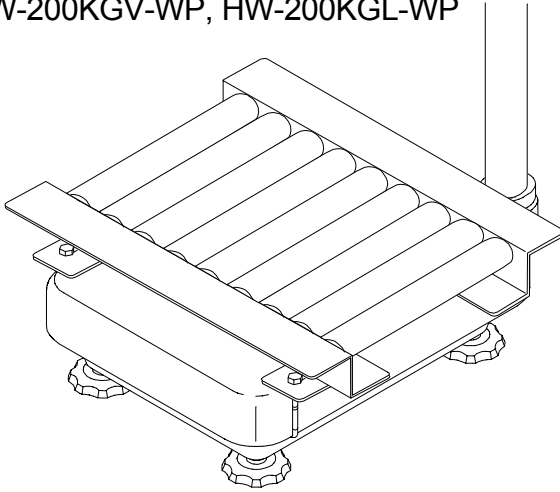


## 17.4. Roller Conveyor (OP-13, OP-14)

### OP-13

This option can be used with the following products.

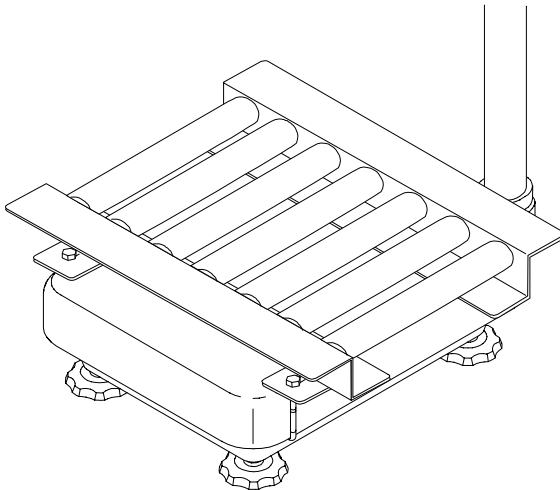
HV-200KGV-WP, HV-200KGL-WP,  
HW-100KGV-WP, HW-100KL-WP,  
HW-200KGV-WP, HW-200KGL-WP



### OP-14

This option can be used with the following products.

HV-60KGV-WP, HV-60KGL-WP,  
HW-60KGV-WP, HW-60KGL-WP





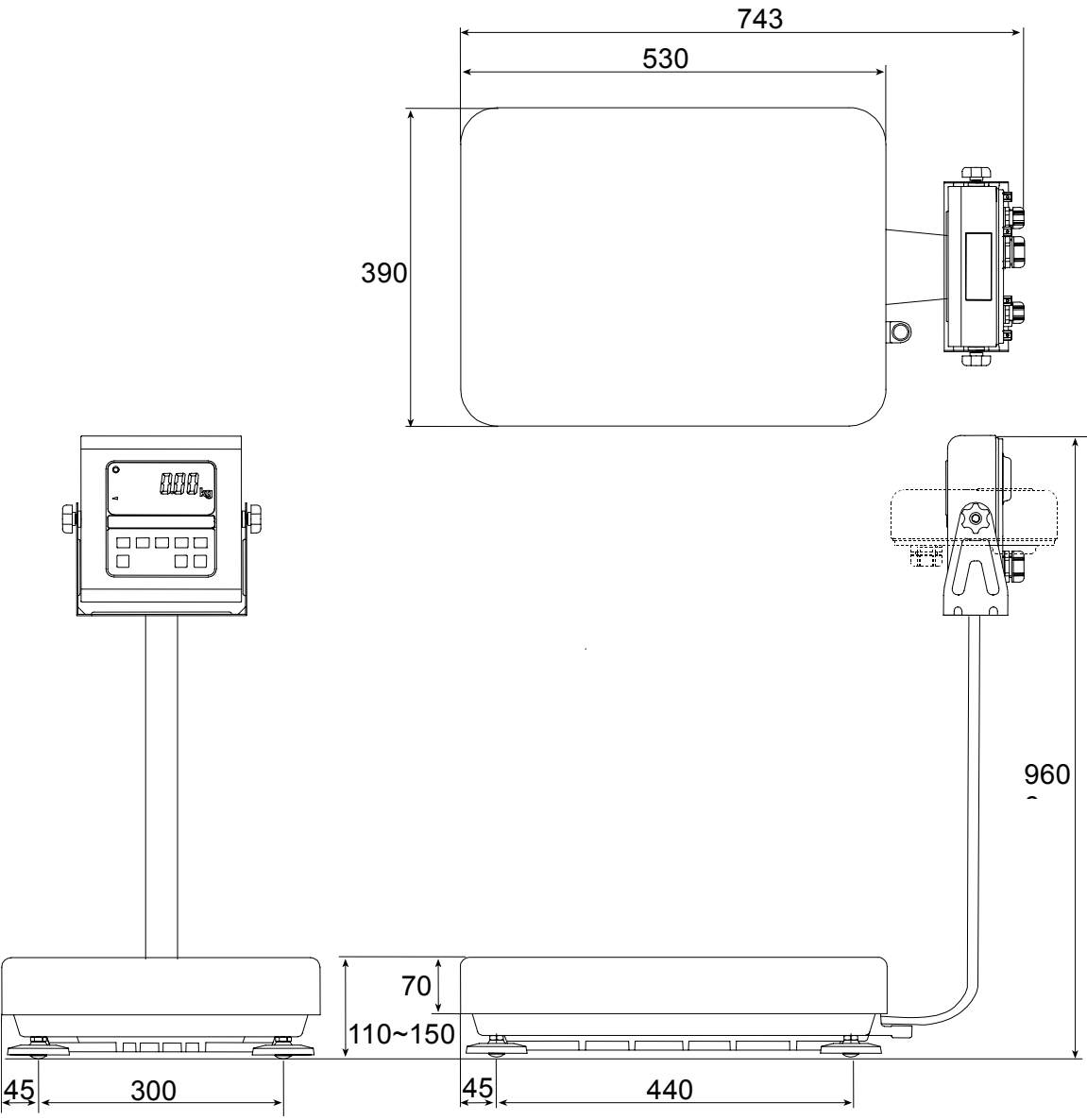
# 18. Specification

## HVG-WP series

Product		HV-60KGL-WP HV-60KGV-WP			HV-200KGL-WP HV-200KGV-WP		
Weighing Capacity [kg]		15	30	60	60	150	220
Min. weighing (1 digit) [g]		5	10	20	20	50	100
Weighing Capacity [lb] #		30	60	150	150	300	500
Min. weighing (1 digit) [lb] #		0.01	0.02	0.05	0.05	0.1	0.2
Weighing Capacity [oz] #		480	960	2400	2400	4800	8000
Min. weighing (1 digit) [oz] #		0.2	0.5	1	1	2	5
Number of samples in counting mode [units]		5 (can be changed to 10, 20, 50, 100)					
Max. count number [units]		12,000			11,000		
Display	HV-GL-WP	7 segment liquid crystal display, Character height 25mm					
	HV-GV-WP	7 segment fluorescent display, Character height 20mm					
Repeatability [g]		±5	±10	±20	±20	±50	±100
Linearity [g]		±5	±10	±20	±20	±50	±100
Span drift		20ppm/°C typ. (5°C ~ 35°C)					
Power rating (VFD)		230V AC (+10%-15%) 50/60Hz 20VA, Fuse T200mA or 120V AC (+10%-15%) 50/60Hz 20VA, Fuse T315mA					
Power source	HVGL-WP	TB: 300 AC adaptor is used to run the HVGL-WP and also to re-charge the built-in battery. The built in rechargeable battery will provide up to 50 hours use if fully charged (16hours). Battery will trickle charge when scale is in use.					
	HVGV-WP	Please confirm that the Main power type is correct to your local voltage and receptacle type.(50Hz/ 60Hz)					
Ambient temperature and humidity		-10°C ~ 40°C, Less than 85%R.H. (Do not allow condensation)					
Weighing pan size [mm]		340 x 420			390 x 530		
Dimension [mm] Width x Depth x Height		340 x 630 x 960			390 x 740 x 960		
Mass of scale [kg]	HVGL-WP	12			14		
	HVGV-WP	12			14		

# : If the law in your area allows, you can use these units.

Dimensions





## 19. Maintenance

- Refer to "4. Caution" for use.
- Refer to "6.1. Display and Symbols " and corresponding mode for displayed error code.
- Refer to "14. Calibration (Adjusting Scale)" for precision weighing.
- Periodically check the accuracy of weighing. Calibrate the scale, if it has been moved to another location or the environment has changed.

### 19.1.1. Repair

Do not disassemble/ assemble the scale without an authorized service technician. It may cause an electric shock or damage to the scale, etc. In this case, the repair is not covered under warranty. Contact your local A&D dealer if your scale needs service or repair.



### 19.2. Check points Before Calling Maintenance Service

In this situation	Confirm these items
No display. Scale does not turn on.	<ul style="list-style-type: none"><li>□ Is the AC power cord properly connected?</li><li>□ Is the AC power the correct voltage?</li></ul>
The scale does not display zero upon power on.	<ul style="list-style-type: none"><li>□ Check around the weighing pan.</li><li>□ Is there anything on the weighing pan?</li></ul>
<span>888888</span> is displayed and does not proceed.	<ul style="list-style-type: none"><li>□ The weighing value is unstable due to drift, vibration or other.</li><li>□ Check around the weighing pan.</li><li>□ Check the load cell cable connection.</li></ul>
<span>-----</span> is displayed and does not proceed.	<ul style="list-style-type: none"><li>□ Check around the weighing pan. Remove anything that is on the weighing pan.</li><li>□ Perform zero point calibration of the scale.</li></ul>
<span>Cal e</span> is displayed	<ul style="list-style-type: none"><li>□ Load cell output too high.</li></ul>
<span>-Cal e</span> is displayed	<ul style="list-style-type: none"><li>□ Load cell output too low.</li></ul>
<span>e</span> is displayed	<ul style="list-style-type: none"><li>□ Weighing error that means "Overload".</li></ul>
<span>-e</span> is displayed	<ul style="list-style-type: none"><li>□ Weighing error that means "Under load".</li></ul>
Fixed display	<ul style="list-style-type: none"><li>□ Do you use the "hold function".</li><li>□ Turn off scale and turn it on.</li></ul>
<span>err 1</span> is displayed	<ul style="list-style-type: none"><li>□ 1 error occurs. Contact your local A&amp;D dealer to repair the product.</li></ul>

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